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TOWARDS A

BIBLIOGRAPHY OF PEACH YELLOWS

BY

ERWIN F. SMITH.

1887— 1888.

Note.

In preparing these notes I have, in addition to consulting old book-stores and private libraries, examined many books in the following named public ones, gleaning all I could find in each:—

U.S. Congressional Library.
Library U.S. Depart. of Agriculture.
" University of Michigan
" Michigan State Agric. College.
Michigan State Library, Lansing.
Public Library of Detroit, Michigan.

"In Sierra Leon the peach is reckoned one of the most valuable of the fruits grown there; at the Cape it is abundant and cheap."--Our Common Fruits. By Mrs. Bayle Bernard, London, 1866. p. 85. Frederick Warne & Co.

The Chinese grow peaches abundantly and have a myth in ancient writings that there was a peach tree of Life which bore only once in a thousand years and a peach tree of Knowledge in some far off time, guarded on a mountain by a hundred demons.--Ibid.p.87.

"There is no country in the world where they are grown in such quantity as they are in the United States."--Ibid. p.87.

"The peach tree was introduced into America by the early settlers, somewhere about [It must have been earlier.] 1680, and before long grew everywhere south of 48° latitude, literally without cultivation."--Ibid. p. 88.

"In the older States [U.S.], however, within the last 50 [70 now] years two great evils have appeared to obstruct the former smooth course of the fruit grower,"--yellows and borers.--Ibid. p.89.

"Far more fatal because less understood [than the borer] is the 'yellows', a malady which affects the peach tree exclusively [?], and seems also to be peculiar to America."--Ibid.--p.89.

"Perfectly unknown [so far as records go] for at least a century after the introduction of the fruit, it was about the year 1800 that it first appeared, in the neighborhood of Philadelphia, and slowly extending its ravages did not become general until after the close of the war [of 1812]."--Ibid. p. 89.

"The grand cause is supposed to be the exhaustion of the land by excessive and unintermittent cropping."--Ibid. pp. 89-90. i.e. lack of proper pruning, etc.

"In lands far less favorable in point of climate [than the United States], but where art has lent its kindly aid to the peach, its existence has been prolonged beyond even the term which nature seemed to have assigned to it; for while the American peach, left to itself, never lives beyond twenty or thirty years, trees in France subjected to annual pruning, have been found, when upwards of sixty years old, still in full health and vigor."--Ibid. p. 90.

"The present state of its culture in England makes the peach almost exclusively a luxury confined to the wealthy.--Ibid. p. 93.

"The stocks in ordinary use for budding the apricot, are

what are called the Brompton stock, the Brussels or St. Julian stock and the mussel plum stock --The Culture of Fruits and Vegetables. By George Glenry. London. Houston & Wright, 1860. p.50.

[Curculio stung peaches ripen prematurely.]

"A pine-apple plant of almost any age may be thrown into fruit by an hour or two's exposure to a frosty atmosphere in winter, or by scorching the roots in an overhot tanbed at any season." Encyclopaedia of Gardening. J. C. Loudon. London, 1827. p.192.

[Compare Plica polonica with yellows.]

Cf. View of the Cultivation of Fruit Trees (Phila.1817). By Wm. Coxe, of Burlington, N.J.

"The best peaches in Europe are at present [1827] grown in Italy on Standards."--Loudon l.c. p.712.

"The leaves of the peach tree are very liable to the attacks of the acarus, its greatest enemy."--Loudon, l.c. p. 718.

"New varieties [of apricots] are procured from seed as in the peach, and approved sorts are perpetuated by budding, generally on muscle or plum stocks."--Loudon, l.c. p.720.

"The peach is sometimes successfully cultivated as far north as Burlington, or even in Montreal. More than fifty bushels have been picked in one season from a single garden

in this town [Burlington, Vt.], but generally, north of latitude 43° it is hardly worth cultivation."--Northern Fruit Culturist. By Chauncy Goodrich, 2nd Ed., Burlington, 1850 p.93.

"The yellows is a contagious disease, supposed to be contributed by the pollen or farina of the blossoms; * * The characteristics are, the leaves assuming a sickly yellow appearance; short and slender branches putting forth, sometimes two or more together, presenting a very sickly appearance, with small narrow leaves; and small mottled fruit ripening prematurely. The only remedy is utterly to destroy all trees infected with the disease, taking care to remove all the roots from the ground."--Descriptive Catalogue of Fruit, Ornamental Trees, etc., for sale at the Linnaean Botanic Garden and Nursery, Winter & Co. Flushing, L.I. 1844-5. p.34.

"This [yellows] is a jaundice or consumption in peach trees, to which they have become liable within the last fifty [seventy] years, constituting the only real difficulty in raising this fruit. * * It has probably arisen from long-continued neglect of culture, combined with overbearing. * * The only known palliatives or rather preventives are moderate manuring, ordinary summer cultivation of the ground, so as to

secure for them regular plowing, etc. which the tree feels almost as quickly as a cabbage; the choice of exposed situations, to avoid winter-killing * * ; and the annual cutting back of all young shoots to one-half or one-third the length of their last season's growth. * * *

"Severe winter pruning and good culture ~~culture~~ immediately after the occurrence of the first indication will to all appearance, perfectly restore the tree; but if these are discontinued, it returns the following season to its former state."--The American Home Garden. By Alex. Watson. Harper Bros., N.Y. 1867, pp. 262-3.

"The American Fruit Book" By S.W.Cole, Boston and New York. 1849 contains two pages (184-5-6) of very sensible remarks on peach "yellows", in which is a very good account of the disease. I quote as follows:--

"The yellows, a disease peculiar to this country only, is the most fatal of all evils to which the peach is subject. So great has been its devastation, in some regions, that the culture of this fruit has been entirely abandoned. The cause of the yellows has not been ascertained, and though some attribute it to poor soil and bad culture (which may have aggavated the evil) yet there are undeniable facts to

the contrary; for new and vigorous trees, from healthy districts, and set on the best of soils, and under the most prudent management, have fallen a prey to this formidable malady." --p. 184.

"Premature ripening always attended the yellows, the unnatural shoots generally, but not always."--Ibid. p. 185.

"Healthy trees, inoculated with buds from diseased trees, soon become affected also."--Ibid. p. 185.

He speaks guardedly on most points, but dogmatically on the above--says it is a "well established fact."

Thinks it may doubtless be conveyed from tree to tree by bees in pollen of diseased trees.

In "An Epitome of Mr. Forsyth's Treatise on the Culture and Management of Fruit Trees." By an American Farmer, Phila, 1804, wherein are several pages of notes on peach trees in America by the Editor, I find no mention of "yellows". He says: "Peaches are in some variety, and ripen to great perfection in the Middle and Southern States; as with but a

little attention they would in the more Northern States of America. It is a fruit that is so natural to the country of these States, that they are applied as food to hogs, also in making brandy, and for culinary purposes. They are in succession, one sort coming after another, from July to November. In some States kilns are erected for drying and curing apples, pears, peaches and other fruits in great quantity."—p. 129.

"It is a common fault, after having planted out an orchard of peach trees, to leave the trees to shift for themselves."--Ibid. p. 130.

"It [the peach] is, when in perfection, the finest fruit of our country for beauty and flavour: it is deeply to be regretted that its duration is so short, and that it is subject to a malady which no remedy can cure, nor cultivation avert [He seems to refer to the yellows]. Of the numberless modes of mitigating or preventing the diseases of the peach tree, with which our publick prints are daily teeming, none have yet been found effectual--the ravages of the worm, which destroys the roots and trunk of this tree, may be sometimes

prevented, and with care may be at all times rendered less destructive, but the malady which destroys much the larger portion of the trees, has hitherto baffled every effort to subdue it; neither its source, or the precise character of the disease appear to be perfectly understood; in one of the consequences of this disease every cultivator of the tree will agree, that it cannot be cultivated with succes on the site of a former plantation, until some years, and an intermediate course of cultivation have intervened: in a nursery established on ground previously occupied by peach trees, the stones may possibly sprout, but in a few weeks they will assume a languishing appearance, the leaves will turn yellow, they will dwindle, and the greater part will perish the first season.

"If trees are brought from a sound nursery and planted on the site of an old peach orchard, or in a garden previously occupied by them, or among old trees, the young plantation will share the same fate with the nursery plants, it will seldom survive the first season, and will never be vigorous or thrifty.

"The fine peaches which are raised for the Philadelphia market, are cultivated in the following manner." [Here fol-

lows an account of methods--not different from those now followed in Maryland and Delaware, i.e. "un-peached" ground, cultivation with corn, etc., searching for borers in spring, summer and autumn.] "With this management, a peach orchard near a market, or on navigable waters, will be a profitable application of land, but no precaution will ensure its duration beyond two, or three, or at the utmost four years,[bearing years, he probably means.]If it succeedseven for this short time, with a judicious selection of kinds, the product will amply remunerate the trouble and expense, beyond any other mode of employing the land in this country.

"The proper soil for a peach orchard, is a rich sandy loam; I have no recollection of a very productive one on very stiff, or cold land."--"A View of the Cultivation of Fruit Trees, etc. By Wm. Coxe, Esq., of Burlington, N.J. Philadelphia, Nov. 1, 1817. Published by M. Carey & Son. pp. 215-17.

Peaches grow vigorously in New South Wales.--Henry Phillips.

"Father Hennepin * * who first described the regions of Louisiana in his voyage down the Mississippi, gives an account of the numerous peach trees which he observed in every

direction it that part of America."--The Companion for the Orchard. By Henry Phillips, New Ed. London, 1831, p. 278.

Phillips thinks on this authority that the peach must be indigenous to Louisiana as well as Persia.

Gerard describes a number of sorts of peaches in 1597 and says: "I have them all in my garden with many other sorts."

Phillips thinks the peach was brought into Ehgland "as early as the reign of Henry VIII," probably in 1524, by Wolf, the king's gardener. The apricot was brought ~~was brought~~ by this man at this date.

Columella mentions peaches as grown in Gaul.

Pliny also speaks of peaches which come from France and Asia.

A writer in The Garden (London) 1881. p.529,. in an illustrated article on peach aphis (Aphis amygdali) says three species occur on the peach, all have the same habits. This is the worst one. He says all three have been named Aphis Persicae by various authors, but are now put into different genera. Says nothing about finding them on roots.

His discription is:--

"The perfect winged insect (fig.1.) is about one-tenth of an inch long and measures about one-fourth of an inch across the wings when they are fully expanded; the color of this insect varies considerably, some specimens being much darker than others. The head and thorax are generally dark brown or nearly black; the eyes are reddish brown, the antennae are composed of seven joints, and are of the same color as the head, except the third joints which are yellowish brown. The body is yellowish, with four dark brown or black spots on either side; each of the first, ~~third or fourth~~ 3 or 4 joints are marked with a dark band, the remainder are covered with a patch of the same color; the cornicles also are nearly black; the legs are yellowish with the tips of the joints and the feet black; the upper wings are large and slightly irridescent, with pale brown veins. The wingless female (fig.2.) is hardly one-tenth of an inch long, and is a much broader insect than her winged sister; it also varies very much in color, some specimens being of a brownish yellow, with various brown or black bands, others being nearly if not quite black, except the legs, antennae and eyes which are of the same color as those of the winged form. The larvae are of rather a reddish-yellow color."

London Garden. 1880. p.558, notes that Prof. Burrill claims to have found the cause of yellows in a bacterium which is in the diseased cells in great numbers--three times as long as broad. (Prof. B. retracted later.)

Burrill's peach yellows bacillus is only .000,006,9 inch.

A writer in the Garden says gummed peach shoots"break weakly".

A writer in the Country Gentleman in 1877 says speaking of peach culture along Niagara River:-- "Most of the peach orchards in this region are in full vigor. They bore good crops for the ~~first~~ past five years in succession. This year from some unknown cause there are very few. It is estimated that the peach orchards of the township of Niagara contain 40,000 trees and it is likely to become noted as one of the best regions of the State [N.Y.]. The best peach region appears to be confined to a breadth of a mile or two along the river. Farther inland this crop has not been so successful, until we reach the neighborhood of Lockport."--Garden (London), June 9, 1877. p. 474.

1 or 1878

Chas. H. Snow, in Garden (London) 1877 writing on "Peach Culture in Mary'and Delaware", says that the baskets contain one-half bushel each; that the Peninsula is 180 miles long by twenty to fifty broad; that no farm is over ten miles from navigable water; that the shipment of peaches in 1875 (official) was 8,000,000 (?) ~~bushels~~ baskets; that farms having 100, 200, and 300 acres in peaches are common; that the principal drawbacks to cultivation are late spring frosts and sleet in time of blossom, and borers. No mention is made of "yellows."

Fred. Bunion, in Wiener Illustrirtes Garten, 1882, p. 194, complains of injury done to peach trees by aphides and says he thinks ants carry them from tree to tree.

Paper on Peaches by Wm. Parry, of N.J., in "Proceedings of Pa. Fruit Growers' Society, 1871."

Ask for shipment of peaches on Del. Wilmington & Balt. R.R and branches for series of years. This was for:—

1869	- - -	2,087,987 baskets.
1870	- - -	1,410,079 "
1871	- - -	2,649,173 "
1872	- - -	3,500,000 (nearly) baskets.

Mr. Parry says, "Several fruit growers, whom I could name, sold [in 1869] from twenty to sixty thousand baskets each, at an average price, after deducting the expenses of picking, freight and commissions, of fifty cents per basket, yeilding them various sums from $10,000 up to $30,000 each, clear profit; all gathered in about six weeks."--l.c. p.47.

"A fruit grower near Delaware City last year [1870] had 140 acres in peach trees, and cleared over $16,000 from them." [Yellows has now destroyed all orchards].--Ibid. l.c. p.47.

[See p. 316]

"A peach grower near Middletown, Del. [almost no peaches there now] who formerly went from New Jersey, had four hundred acres in peaches last year, and although not a full crop, was offered $30,000 for them, but refused to sell, and had them pickled and marketed on his own account, and cleared $38,000." --Parry. l.c. p.47.

"Many of us are no doubt familiar with the history of the 'Peach Blossom Farm' in Kent Co., Md., containing six hundred acres, with four hundred acres in peach trees just

coming into bearing [visit this farm next year] that was sold at public sale, in the winter season, a few years since for $31,500. That same year the purchaser sold peaches from it to the amount of $52,000." The author states that the expenses were:

Picking,	$1,500.
Transportation,	9,000..
Cash paid for steam boat,	10,000.
	20,500.
Cost of Farm,	31,500.
	$52,000.

--Parry. l.c. pp. 47-8.

Mr. Parry also says (pp. 49-50):--"So far as peach growing on a large scale is concerned, the net profits may very safely be set down at from $100. to $175. per acre.--While in many instances they yield right through from $175. to $250. per acre."

Root lice occur on apple trees.--Tilton's American Journal of Horticulture. 1871. p. 310.

Three years ago (1867 or '68) 300,000 boxes of peaches were shipped from the vicinity of Centralia, Ill. This year

(1870) the peach crop promises to be the largest ever raised there.--Tilton's Journal of Hort. Boston, 1870. p.107.

"The first really great Delaware orchard was planted in 1838 by Jacob Ridgeway, the Philadelphia millionaire. Other large ones were soon established. About this time, a small orchard of forty acres realized a clear profit of $9,000 from a single crop,--about ten times more than the land was worth." --Edmund Morris, of Burlington, N.J., Tilton's Jour. of Hort. 1870. p. 72.

Peach orchards of California.--The Alta is authority for the statement that California has 800,000 peach trees. Tilton's Journal of Hort. 1870. p.48.

"Mr. Shallcross, near Middletown, Del., owns the largest peach orchard in the world [1874]. Last year he shipped to New York 125,000 baskets of fruit" * * Mr. S's orchard "covers an extent of more than 100,000 trees. The land on which Mr. S's trees are planted is worth $150,000."--The Horticulturist, etc. New York, 1874. p.287.

The estimated number of peach trees on the Peninsula, [Md. and Del.] was in 1873-5,000,000 representing 50,000 acres.-- The Horticulturist, etc. 1873, p.219.

Profits on peaches, from note book of E.C.Fennimore, Del., cited in The Horticulturist, New York, 1871. p. 316.

He sold in;—

Year,	Baskets,	Bringing $
1861	191	206.24
1862	1,893	868.35
1863	18,423	15,051.81
1864	25,964	18,434.89
1865	22,164	23,070.25
1866	43,675	20,266.07
1867	27,500	18,551.40
1868	4,050	15,281.68
1869	34,000	14,464.27
1870	16,029	15,607.76
10 Years,	164,050 baskets,	$150,811.80

Horticulture on the Delaware Peninsula. Chas. Downing, Geo. Thurbur, P.T.Quinn, Wm. Parry, Randolph Peters, and Howard M. Jenkins, of the Delaware Tribune visited this section

in August, 1871. Some of their statements relative to peaches are as follows; I quote from a synopsis in The Horticulturist, N.Y., 1871. pp. 306-7-8.

Large Peach Farms.

Several near Middletown, Del.; Farm of late Cantwell Clark, 280 acres of peach orchard; Farm of J.T.Ellison, 100 acres; B.T.Biggs, four farms, 35,000 trees [about 350 acres]; Farm of J.B.Fennimore, one of the largest growers [size not given]. "The orchards near Middletown are in fine condition, the land being heavier and trees more productive than at points farther south." Farm of Samuel Townsend, near Smyrna, Del., contains 400 acres [of Peach] and he ships three cars of fruit per day; at Round Top, Md., is the farm of John Harris, who has 1,013 acres in peaches, nearly all in full bearing. The biggest orchard in the United States is said to be that of Col. Edward Wilkins, near Chestertown, Md., who now has (1871) "136,000 trees", or "1,350 acres".

"A well known peach grower near Chestertown [Md.], favored the party with figures of his gross receipts from a peach orchard of 325 acres, during a term of nine years. Trees in this orchard in 1862, were then but four years planted:

Year,	Gross Receipts,
1862 - - - -	$12,600.00
1863 - - -	32,340.00
1864 - - - -	32,399.00
1865 - - -	48,042.98
1866 - - - -	16,804.00
1867 - - -	9,989.00
1868 - - - -	1,350.00
1869 - - -	30,429.00
1870 - - - -	22,000.00
In these nine years value of brandy made,	15,150.00
Total,	$231,043.98

More than half of this went for expense of marketing and gathering, the rest was profit."--p.308.

Chilled trees and "Yellows". Darkhearts were found in sick trees by Fruit Growers Club of New York.--The Hort. 1869. p. 90.

[Combat this dark heart notion.]
See Hort. Soc. records of examinations.

"Our great peach enemies, the yellows and peach worm, are alike unknown here [England in 1849]. He [Mr. Thompson,

of the gardens of the Horticultural Society at Cheswick, London] has seen one instance only of a disease in a peach tree, resembling in its character the yellows. It was an American tree, I think a George IV, which was budded on a peach bottom, and trained against a south wall. It ripened its fruit prematurely, pushed out the cluster of small leaves, became quite yellow in foliage and finally died. * * The disease he referred to was probably imported in the tree from America. If so, it does not seem to have communicated the yellows to any of the English trees."--H.W.Sargent in Account of "A Visit to the London Horticultural Society's Garden." The Horticulturist, (Downing's), 1849. p.16.

"We have satisfied ourselves that the mere contact of a knife which has been used in pruning a tree diseased with the yellows, with the sap vessels of a healthy tree, is sufficient to communicate the yellows to the latter."--A.J.Downing. The Horticulturist, Albany, 1849, p.563.

"Fifteen years ago (1843 → 34) there was scarcely a tree in the vicinity of Newburgh, [N.Y.] that was not more or less diseased with the yellows. By pursuing the course we have indicated [digging up and burning every vestige] the disease has almost wholly disappeared."--A.J.Downing, l.c., p.563.

As long ago as 1848, J.W.Bissel, of Rochester, N.Y., in The Horticulturist, [Albany, N.Y. p.34] said that there is a loss of lime and potash in soils where many peach trees have been grown and suggested that the yellows might be due "to the absence or small quantity of these alkalies." He says he has never seen any analysis of the wood, but suggests that such be made.

There seems to have been little or no yellows in Western New York prior to 1848. See article from which above is taken, also note ~~data~~ in same Journal, 1846., p.237.

Mr. James W. Thompson, of Wilmington, Del., whom A.J. Downing calls "one of the most intelligent orchardists in the country", in a letter first published in the Southern Planter and afterwards in The Horticulturist, 1846, pp. 36and 37, says: "To Mr. Isaac Reeves, a native of New Jersey, is the whole credit due of first introducing on a large scale, the culture of the inoculated peach tree into Delaware. The late Mr. Jacob Ridgway, of Philadelphia, owning a farm near Delaware City on the Chesapeake and Delaware Canal, was induced by Mr. Reeves to become his partner; and upon this property

in the spring of 1832, they set out the first twenty acres of inoculated peach trees ever planted in this State, with a view of supplying the Philadelphia market. They rapidly extended their plantation to about 120 acres,--were eminently successful, and one year--the very best season they ever had--their gross income from the sales of fruit was about $16,000. Peaches then commanded from $1.25 to $3. per basket, containing about three pecks. In the spring of 1836, the late Mr. Manuel Eyre and myself followed suit upon our 'Union Farm' midway between Wilmington and Newcastle on the Delaware river, to about the extent of 140 acres. In a year or two afterwards Mr. Phillips Reybold & Sons went into the business--then a host of others, until now [March 26, 1846] from 2,500 to 3,000 acres of land, in Newcastle Co., are planted with and succesfully cultivated in peaches--making Delaware, though the smallest of the States, the largest producer of this fruit." The trees were then set twenty or thirty feet apart; tilled in corn first three years; then the orchard was kept fallow. The borer was very abundant and trees were examined for them each spring and fall. "The average life of our trees is from nine to twelve years, when properly cared for and protected." They had the yellows and he calls it "by far the most destructive enemy of the peach tree."

At this time yellows was said to be present in New Jersey from which it had occasionally been imported into Western New York.--The Horticulturist. 1846, p.237.

"Yellows in peach trees."

The Horticulturist, 1846, pp.212-14. L.W.Yman, Jr., states that he has communicated yellows to healthy trees, by pruning--purposely done with an infected knife.

In same volume, pp . 318-19, W.R.Prince, of Flushing, L.I., says: "Formerly it was a common saying about New York, that the yellows was attributable solely to the proximity of the Lombardy Poplar, and that the introduction of that tree formed the fatal era for the introduction of the yellows and was the cause of its perpetuity. A general crusade was thenceforth carried into opperation against the poor and unconscious poplars until every one of them was exterminated. x x The disease continued to traverse ~~all~~ the peach orchards of several States, until an almost universal extermination took place, and every one who will visit the once splendid peach orchards in various parts of New Jersey [1846] will be struck by the desolate aspect of immense plantations of dead trees, with

only here and there a sprig of verdure. x x In this island the malady became exhausted some years since, by the utter destruction of the old orchards, and the determination not to plant new ones until it became extinct. This course proved most fortunate as the disease has been for years banished from Long Island, and now new orchards are springing up everywhere x x 'redolent with health'."

He adds that yellows is never imbibed by any peach tree until it has blossomed--incisions excepted. Says they do not blossom until the second year. Mr. Downing in an editorial note says he thinks the disease may spread from diseased stocks and adds "We agree with Mr. Prince, that the yellows is fast disappearing, and trust, in a few years, as good cultivation becomes general, it will entirely disappear". [How wide of the mark he shot!]

The Galena Courier reported an immense crop of peaches in Union and Jackson counties, Ill., in 1860.--1,000,000 bushels. [Can this be true?]

"L.F." states in Gardeners' Monthly, 1872, p.118, that yellows has commenced its ravages at St. Joe., Mich., where he has a twenty acre orchard.

Dr. Wood, of the Philosophical Society, [Philadelphia] has found potash benefit yellows. Thos. Meehan. 1872, Gardeners' Monthly, p.17.

Thos. Taylor on Yellows, reprint in Gardeners' Monthly. 1872. p.374.

"The end of May we received from Mr. Kerr, of Denton, Md. specimens of the peach aphis, which has been more than usually destructive in that region this year." Gardeners' Monthly, 1874. p.216.

To a Maryland correspondent who asks; "Are we to abandon all hope of getting at the root of the terrible disease known as yellows?" Mr. Thos. Meehan replies in Gardeners' Monthly 1874, p.245: "The 'mystery' is only with those who do not read the gardening papers, and think that what they do not see no one else can know. Our knowledge of plant diseases has been very much simplified of late, and many of them are well understood, the peach yellows among them etc." [Never was greater nonsense palmed off, with pompous show of learning, on the unsuspecting.]

"Col. Wilkins, of Maryland, is sure that an aphis causes the yellows in the peach. The peculiar process by which this cause was traced to this effect, we have not had described to us."--Gardeners' Monthly. 1876, p.211.

Peach curl is said to be a fearful pest in California. Ibid. 1877, p.56.

Peach Yellows Law did not apply to all counties in Michigan in 1878--e.g. Berrien etc. were exempted. W.J.Beal, in Gardeners' Mo., 1878. pp. 24-5.

"The 'curl' has nothing to do with the yellows, which, as already stated in our magazine, is caused by the mycelium of a species of Agaricus. It rarely developes into a perfect toad-stool, though in the writer's carefully conducted experiments [sic] he has bred them. The spawn attacks healthy living roots and permeates the tree through all its parts." Thos. Meehan. Gard. Mo. 1879. p.80.

"There is nothing more certain than that the Yellows in the Peach is a root fungus. This is so easily ascertained

by anybody who will take the trouble to look and see for himself with an ordinary pocket lens, or to inquire with his nose, if he has no lens, and no 'cold in his head', that we look on all discussion as to the cause of the yellows as time thrown away." Thos. Meehan. Gard. Mo., 1879, p.20.

"Yellows has made its appearance in one or two orchards about Grimsby, Canada." Canadian Horticulturist.--Gard.Mo., 1879. p.47.

A South Haven correspondent of Gard. Mo., 1879, p.207, speaks of"thickened spots in the pith of the bearing wood."

Mr. Parnell's Georgia peach orchard contains 150,000 trees. We suppose there are few if any so large in Americ. --Gard. Mo., 1886. p. 177. [Visit.]

D.S.Myer, Bridgeville, Del., in an interesting article in the Gardeners' Mo., Philadelphia, 1880, pp. 206-7, on "The peach Aphis" says:--"We know but little about the yellows here in fact I don't know that I can say I could certainly point out one single case of the yellows. * * Some six or eight years ago* the peach aphis visited us in unprecedented numbers, destroying most of the trees one year planted, and severly in-

* Apparently all over the peninsula at this time see Col. Wilkins account. No Yellows at Bridgeville in 1888.

jurin[ing] some two year or older trees. The effects on the trees visited by them was plainly visible, the leaves turning yellow and not having anything like their usual size; many trees dying outright, others so weakened as to be entirely worthless." * * [Mr. Myer describes a meeting of Milford, Del., Fruit Growers' Society, at which were present some distinguished fruit men from abroad.] He dug up and took some of these aphis-infested trees.] "Taking a spade and grubbing-hoe I marched off first and dug up two or three of the two year peach trees, root and branch, that had been covered literally black with peach aphis in the spring, but had disappeared on the approach of hot weather, letting some of the branches be on with the leaves, and the roots as left by the aphis. Taking the peach branches with me when I was called up on to give my store of information, I presented the tres aforenamed, asking the doctors what was the matter with those trees. To my surprise David Petitt, of New Jersey, pronounced them genuine cases of yellows.

"I can tell you it caused no little merriment in the crowded room of Delaware Fruit Growers. Not one ever hearing much less seeeing a case of genuine yellows [about 1875], as we have learned of it through books and papers in other sections. [Then was probably very little if any yellows about Milford in 1875]

"I explained how the trees I exhibited did come in that condition, and further all I knew about the aphis from careful observation. I have read all the information I could get on this insect. I must say that even Prof. Riley does not say much about its habits. * *

"I have dug up peach roots that were six to twelve inches deep in quite wet, red soil, when the surface of the ground was cold, almost frosted. Thousands, yes, millions in some cases, were on the roots, the smallest so small as hardly to be seen with the naked eye, yet brought under the microscope, even the small ones were awful looking sap suckers."

In the Gardeners' Mo., 1880, p.50, Thos. Meehan says yellows is due to a "cobwebby fungus" on the roots, "which feeds on and destroys the ends of the growing rootlets."

[This fungus, which I have seen, is ~~undoubtedly~~ probably a saprophyte.]

"In all my experience in England as a gardener, I never saw anything like the disease called yellows here. I do not think the thing is found there, and can you tell the reason why?" "J.K." in the Gard. Mo., 1880, p.145.

P. J. Beckmans, Augusta, Ga., in the Gard. Mo., 1881, p.83, denies that peach yellows occurs in Georgia. In his twenty-five years experience he has never seen it south of New Jersey Thos. Meehan again affirms that he saw plenty of yellows-diseased trees in Mississippi along the "Jackson route" from a car widow. On p. —, 1881, a correspondent denies this. Says he is "pretty well acquainted with the orchards along the Jackson route." On p. 209, is another denial from Mississippi. [Meehan's statement is not worth much in the face of these denials.] Yet as a rule the statement of the man who has seen is better than the denial of the man who has not seen. It may have been Rosette

"Yellows and Peach Culture." By Chas. Black, Highstown, N.J., the Gard. Mo., 1882, pp. 111-112. He thinks crowding one cause. Says: "If your trees are too thick pull out every other row, and as a rule you will cure the yellows." [Cf. Orchard of Alex. Fulton, of Dover.] Says trees are sometimes set as close as eight or ten feet, but that they should be eighteen or twenty feet apart. [In Fulton's orchard in 1887 the trees are 40 ft. apart, Yet I saw there in quite a number of well marked cases - orchard near Glass Factory.]

Hon. Lorin Blodgett, on "History of the Peach in America." in the Gard. Mo., 1882, p.347, quotes a letter from Wm. Penn, Aug. 16, 1683, which says:--"The fruits I find in the woods are white and black mulberry, chestnut, walnut, plumbs, straw-

* In early part of July 1888 I reexamined this orchard. I found my first ex. had been correct. E.F.S. This whole orchard was ruined by yellows in 1888-90.

berries, cranberries, hurtleberries, and grapes of diverse sorts. x x Here are also peaches, and very good and in great quantities, an Indian plantation without them; but whether naturally here at first I know not. However, one may have them by bushels for very little; they make a pleasant drink, and, I think, not inferior to any peach in England, except the true Newington." Mr. Mechan says in a note on this that there is a letter in existence written a year before by a Jersey man, Mahlon Stacy, which says: "We have peaches by the cart load."

Long paper on Yellows by W.K.Higley in American Naturalist, 1881.

"It is many years since the writer of this paragraph demonstrated that in the early stages of the disease the roots of the peach tree are covered by the mycelium of a species of Agaricus. x x That this fungus, by feeding on the roots, is certainly connected with the disease, he proved by taking spades full of the earth, and placing them around healthy trees, when the 'yellows' resulted. Other trees also received the fungus and the yellows followed, especially the

Norway spruce, white spruce, and white pine. Indeed, the development of the disease after this inoculation with the root fungus, is more clearly traced and its opperation better understood in the Norway Spruce than in the peach itself."--Thos. Meehan, in the Gard. Mo., 1882 or 1883.

The old Yellows Law applied according to T.T.Lyon, Gard. Mo., 1883, p.15, only to the counties of Van Buren, Allegan and Ottawa.

New Peach disease in England called yellows by London Jour. of Hort. 1882.. See the Gard, Mo., 1883, p.15. It may(?) be same as ours. No description definite enough to determine.

J.A.Lintner, in a communication to Mr. Blodgett, published in the Gard. Mo., 1884, pp.271-272, on"Peach Root Aphis" says: "It is a species I am unacquainted with, I have given no special study to this particular group, and without it they are hard to determine, without having the several forms, living, particularly the winged form. I think that the species is the Myzus Persica, Sulzer, introduced from Europe."

Ibid. p. 273, Mr. Lorin Blodgett writes: "I send herewith the stem of a seedling peach tree just withering from the effects of a new scourge, the root aphis, I think, which clustered thickly around the stem, from two inches down up to the surface. I lost almost all my seedling peach trees from this cause last year and this year. I think some three years ago also. Is it new?" Mr. B. also says"Yellows" "has killed all my large trees.

"Peach Root Aphis." By Chas. Black, Hightstown, N.J., Mr. B. seems well informed and I quote most of his letter "I am surprised that it should be considered new, I think very few observing peach growers, especially nurserymen, who grow young trees would call it new,--it has committed such damage to young trees that all ought to remember it. I have for years past in favorable seasons seen more or less of it on the roots of young trees; they are brown or black, and cluster on the small roots of the trees, and wherever a cluster of them forms on the roots they suck out the sap and life of each individual root that they may be on, and it will die, and others be alive that are free from the aphis. When in sufficient numbers, they kill the tree outright--they often

infest the top of a tree also--both in the dormant and in the growing state. I have often seen them in such large numbers on young trees, as to look as if the tree had been hurt by frost, or some other cause. Two years ago I visited a nurseryman, and in looking over his nursery, he called my attention to a lot of peach trees, saying that a previous cold storm had injured them badly. As soon as I saw the trees, I explained the cause, and upon examination we found millions of this aphis which had infested the roots of the previous year, and in the spring had come up on the tops, and in favorable weather had increased wonderfully. It is easy to destroy them when on the top by tobacco water or dust, but hard to get at [them] when on the roots. It infests the small fibre roots of larger trees also and gradually saps the vitality of the trees, which turn yellow, and eventually die; and the so called yellow[s] is often caused by the ravages of this little underground robber.

"It is more prevalent in cold backward seasons, and on sandy soils and it is almost impossible to raise small seedling trees in the vicinity of old trees, as it prefers the young roots, and kills the young tree in a single season.

"I am satisfied that it comes up from the roots to the top. x x This fact I have learned by experience in growing peaches under glass. We put our trees in our house in December without a sign of aphis on the tops; in a few days I find full grown ones on the trees, and in a short time there are myriads of them. x x We never see the winged insect, so common among most aphides. x x We generally find them on the roots in autumn, say November, and at any time during the winter [we find them] in our orchard house." Gard. Mo. 1884. p.305.

Mr. Lorin Blodgett says: "It [aphis] has killed every seedling peach on my grounds and works away at the roots yet." Ibid. p.336.

Thos. Meehan says, in Gard. Mo. 1884, p.94: "At the end of the last century we find in the literature of the time many complaints about the short-lived nature of the tree of late years, and in 1805 [wrong date], the American Philosophical Society offered a premium of $60. for the best essay which should point out the cause and the remedy for this disease."

"It seems to us that the difficiency noted by Prof. Ben-

hallow in diseased wood comes from the inability of the tree from disease, to make use of potash, rather than from its absence in the soil. The 'yellows' in fact is a case of vegetable indigestion."--Thos. Meehan, Gard. Mo., 1885, p.148.

The Gardeners' Chronicle, London, England, 1885, p.594, in reviewing one of Penhallow's papers, speaks of it as "This disease, little known in this country."

The Gardeners' Chronicle, 1879, p.114, records having received black peach aphides (A. Persicae) from an English correspondent and says of our own experience "it is " far too plentiful this season."

Another correspondent, p.153, says: "They are abundant at Chantry near Ipswich.

In Vol.I of "Memoirs of the Philadelphia Society for Promoting Agriculture" published by Johnson & Warner, Philadelphia Pa., 1815, containing papers read before the society from its organization in 1785, are no less than five or six communications on peach trees and their diseases, and there are incidental references in other papers. The borer was very prevalent and destructive, but another disease was also present.

These papers and notes are:

1. "On Peach Trees. By Joseph Cooper, of New Jersey, Read Jan.14, 1806." pp. 11-14.

Mr. Cooper knows the borer well, and speaks of it as abundant. But he apprehends that sudden transitions from heat to cold and from cold to heat "are more destructive to peach and cherry trees than insects, as I have had hundreds of fine trees perish in one summer, after an irregular winter without being in the least injured by worms." [Was this yellows?] Farther south where the climate is more even and the spring two weeks later he has from good authority that peach trees live "to the age of thirty or forty years." All this he attibutes ~~to backwards~~ to the backward springs and general milder effect of Ocean climate.

He examines his peach trees every spring and pulls out those "in a declining state." Says the body or trunks appear to be the seat of the disease. [Nothing clear as to "yellows" here.]

2. "On Peach Trees, By Richards Peters, Read Feb.11, 1806." pp. 15-24.

In this paper so far as I can find occurs the earliest use of the word "yellows" as applied to a disease of the peach.

It is not clear, however, from anything in this paper whether the disease in question was what we now know by this name. The probabilities, however, are strongly in favor of it from the fact that it was a destructive malady not due to borers, and from statements in papers published by others in the years immediately following 1806. Judge Peters was president of the society, and a distinguished man. His description is vague enough. He says: "About fifty years ago [1760?], on the farm on which I now reside [Belmont, now included in west part of Philadelphia in Fairmount Park], my father had a large peach orchard, which yielded abundantly. Until a general catastrophy befell it, plentiful crops had been for many years produced with little attention. The trees began nearly at once to sicken, and finally perished. Whether by the wasp then undiscovered, or by some change in our climate, I know not. For forty years past, I have observed the peach tree in my neighborhood to be short lived. Farther south; in the western country; and it seems in some parts of New Jersey, they are durable and productive, as they had been formerly here." He has two hundred peach trees of all ages, thirty-two varieties, and says: "Mr. Coxe, Of Burlington, N.J., has double that number."

He speaks of covering trunk to keep away insects.--"Tegu-ments of straw or bass made the bark tender; and it threw out under the covering sickly shoots" [yellows?].

He knew the borer: "The worm or grub produced by the wasp, depositing its progeny in the soft bark near the surface of the ground, is the most common destroyer." * *

"When trees become sickly, I grub them up. I find that sickly trees often infect those in vigour near them, by some morbid effluvia." * *

"Although I have had trees twenty years old, and know some of double that age (owing probably to the induration of the bark rendering it impervious to the wasp, and the strength acquired when they had survived early misfortunes), yet in general they do not live in tolerable health after bearing four or five crops." * * "The shoots of the last season were remarkably injured by the excessive drought; and the extremities of many limbs are entirely dead." [Feb. 11.] * *

"Fifteen or sixteen years ago [1790], I lost 150 trees in full bearing in the course of two summers, by a disease engendered in the first season. I attribute its origin to some morbid affectation in the air, * * The disorder being generally prevalent, would among animals, have been called an

epidemic. From perfect verdure its leaves turned yellow in a few days[?], and the bodies blackened in spots. Those distant from the point of infection, gradually caught the disease. I procured young trees from a distance, in high health and planted them among those the least diseased. In a few weeks[?] they became sickly and never recovered." Other kinds of fruit trees "were not in the least disordered."

He finally dug out all of them.

"After my general defeat and most complete overthrow, in which the worm had no agency, I recruited my peaches from distant nurseries; not venturing to take any out of those in my vicinity. I have since experienced a few instances of this malady; and have promptly, on the first symptoms appearing, removed the subjects of it, deeming their cases desperate in themselves, and tending to the otherwise inevitable destruction of others."

Mr. Peters says Edward Heston in his neighborhood has "7 or 800 trees" * * "now in vigour and very productive" and farther on,--"Mr. H. begins to suffer by the disease I call the 'yellows' [page 23. First use of the word] though he has fewer worms, than common in other modes [of cultivation]."

Written apparently considerably later

3. Again, nearly two years later (Sept., 1807), Judge Peters records in a brief note:--"As I predicted, the 'yellows' [Second use of the word] are seen making destructive ravages in Mr. Heston's peach plantation. I have lost a great proportion of my trees by the same malady this year. Some of them were young and vigorous. We have had two successive rainy seasons. I do not recollect ever to have seen more general destruction among peach trees, throughout the whole of the country. It seems that excessive moisture is one of the not primary cause of this irresistable disease." p.24.

4. "I am pursuing my old plan of reinstating my peach trees, lost last season [1806 or 1807] by my unconquerable foe, the disease I call the yellows. I obtain them from different nurseries, free from this pestiferous affection. The worm or wasp I have in complete subjection. I should be perfectly disinterested in proposing that the society offer a premium for preventing the disease so fatal; for I shall never gain the reward." Apperently a post script ~~written~~ to a letter written by Richard Peters, April 20, 1807. p.120.

5. Under date of April 5, 1807, in a letter to Mr.

Peters, the fruit grower, William Coxe, of Burlington, N.J., says: —

"I am perfectly ignorant of the disease to which you give the name of the yellows. Nothing of this description has ever appeared among my peach trees. For four or five years past, my trees have borne well, and have resisted the worms." Ibid. p.120.

6. "On peach Trees." By Richards Peters, Belmont, Nov. 17, 1807.

"I still think, that the disease, so generally fatal (more so this year than any other in my memory), called the yellows, is atmospherical." Ibid. p.189.

"I received verbally from a wealthy farmer (Mr. Bellah) who is the proprietor of a considerable landed estate in Delaware, [about 2½ miles East of Dover] the following account, which he says is generally applicable to the culture of peach trees in the southern country:" [Here follows the account.]

"'In Kent Co., Del., they cultivate the peach without any difficulty or risk. x x The crops are certain, abundant and well-flavored. x x They obtain fruit in three years in plenty; and the trees have been known to endure fifty years.

No worms or diseases assail them. * * There are orchards of fifty and seventy acres; and some larger in Accomac and other parts of the isthmus between the bays of Chesapeake and Delaware farther south. * *'" Mr. Peters adds: "Compare this account with the actual state of the peach in our country [around Philadelphia] and judge whether we live in a region favorable to its growth. Mr. Heston's attempt at cultivating this tree, in the southern manner, begins already to fail. His trees are evidently infected; and many are on the decline. The yellows are universally prevalent this season throughout the whole country [i.e. about Phila.] (Ibid pp. 189-190, and 191.

7. In a letter to Mr. Peters under superscription of "Bellevue (near Wilmington, Del.,), Nov. 6, 1807." pp. 192-197. Dr. James Tilton says:--

"A fine early peach, which ripened in Northampton, Va., so early as June, did not ripen on my farm, before the last of August and first of September" [Was it a premature at Northampton?] * * "The diseases and early death of our peach trees is a fertile source of observation, far from being exhausted." Dr. Tilton thinks all the peach diseases are caused by insects. He says: "Even that sickly appearance of

the tree, called the yellows, attended by numerous weakly shoots on the limbs generally, is attributed to insects by a late writer in our newspapers." [This is "yellows" as we know it now, beyond much doubt] p. 194. Dr. T. also speaks of "measures proposed in our newspapers for curing the yellows." p.195. Ibid.

On page 196, Dr. T. says: "In my jaunt through Maryland I was attentive to the subject of your letters. I found the peach trees generally were long-lived, healthy, and bore well. In Edward Lloyd's garden, [at Wye House, near Tunis Mills, Talbot Co.,] I observed some of these trees fifteen or eighteen inches in diameter, and perfectly healthy. Col. Nichols, near Easton, [Md.], abounds in the best kinds of peaches. He is an old resident, or particularly attentive to fruits."

8. "On peach trees." by Timothy Matlack, Esq., Lancaster, [Pa.], 7 March, 1808." Ibid pp.278-284. Knows about borers, but makes no mention of "yellows."

"This disease [yellows] which has hardly been known in Ohio, [1878] except by name, has caused much trouble and apprehension among the peach growers of the lake shore district of Michigan for a year or two past. It has ruined quite a ~~large~~ number of large orchards, and seems to be still

spreading, in spite of the efforts to arrest it by cutting down and burning all affected trees, as is done by compulsory law. It appears too from recent accounts that the disease made its appearance the past season and is spreading rapidly this summer [July, 1879] in the lake shore peach orchards of Niagara Co., N.Y., so there is reason to fear that the lake shore region of Ohio will have a visitation of the malady."-- Twelvth Annual Report of the Ohio State Horticultural Society, (Columbus, 1879). p.106.

[I have examined these Ohio Reports from 1870 to 1887. Nothing on yellows in Ohio except denials of its presence in various parts.]

[I have indeed read all the literature I can find on this subject, but at the same time whatever statements I have made as to the nature of the disease are primarily inferences from my own observations rather than conclusions derived from reading, and if fragmentary, the reason will be apparent. I have endeavored to separate as clearly as possible what is established fact, from what is only theory or probability. It is very evident that an enormous amount of rubbish has been written on peach yellows.]

"He [Mr. Dyckman, of South Haven] is reported to have an annual income of from $8,000 to $12,000 from his peaches." — Au. ~~Ibid. p. 274.~~ Rep. Secy. Mich. St. Hort. Soc. 1880, p. 274

"Varieties do not differ as to liability to yellows; nor do soils cause it, one more than another, except as they influence the general condition of the trees. It is ~~undoubt-~~universally ~~edly~~ conceded that the most vigorous trees, on the best soils are as liable to the disease as any." p. 274. Paraphrase of T.T.Lyon's remarks before the August meeting, 1880. Allegan Horticulture Society. Annual Report Secy., Michigan State Hort. Society, ~~March,~~ 1880.

"A tree cannot escape if even one peach becomes diseased; it will die in two or three years." T.T.Lyon. Ibid. p.275.

[More early excision experiments must be tried.]

T.W.Sithes of Millgrove, reports that he cut off a twig which bore premature peaches and next year the tree was as healthy as any in the orchard.--Ibid. p.275. [C.W. Garfield, gave me to understand that there seemed to be some foundation in S.W. Mich. for such a statement; or at least that some person had insisted that it was a fact.]

"Secy. Garfield said Mr. G.S.Woodard of Lockport, N.Y., put out thirty acres of peach trees a few years ago, and now [1880] he is taking them all out before having got a crop, all being diseased with yellows. He thinks they must stop raising peaches there." p.275. "Mr. Garfield first saw the St. Joseph region in 1871. The orchards then were almost everywhere. * * Now there is scarcely one left. The growers there say the yellows did the work of destruction." Ibid p. 275.

"They are giving up peaches [at Benton Harbor and St. Joseph Mich.] on account of the yellows." Report Mich. State Pom. Society. 1877. p.402.

Full text of Yellows Law of 1879. pp.363-65 of An. Rep. Secy.St.Hort.Soc.Mich., 1879.

"S.H.Comings [of St.Joseph] read a letter from a friend in New Jersey, which stated that peaches were now growing to perfection there in regions devastated by the yellows but a few years ago."--Sept. 18,1880, Benton Harbor meeting, Berrien Co. Hort. Society. Annual Rep. Secy. Mich. State Hort. Soc. 1880. p. 313.

[The present yellows law of Michigan applies to peaches, almonds, nectarines, and apricots.]

[The old yellows law of Mich., 1879, was loaded down with provisions and impractable. The present one is concise, clear, and practical.]

Does the law stand to-day as it did in 1885? Yes, 1890.

"Let it [yellows] once get a foot hold and the orchard is doomed; so is the neighborhood, so far as peaches are concerned."--C.D.Lawton, at Winter meeting of State Hort. Soc., Lansing, Mich., Feb. 1879, p. An.Rep.Secy.St.Hort.Soc., 1879. p.30.

"Unfortunately there are many persons of the opinion expressed by your correspondent, better let the trees go [remain] and take their chances. They adopted this course in the vicinity of St.Joseph and Benton Harbor, and as a result what was but a few years ago one of the most noted and prosperous fruit regions of America has had its most profitable industry entirely destroyed by an unfortunate adherence to this same short-sighted policy."--Ibid. p.21.

[This paper covers pp.20-23.]

"In the early history of the disease [yellows in Michigan] before its devastating power was known, law seemed unnecessary, but after years of experience by peach growers,--after orchards had been laid waste and abandoned in nearly all the old peach growing districts of the east, and after the disease had well-nigh ruined the once beautiful orchards of St. Joe--nothing less than the purpose of extermination could have stimulated those who sought for legal protection. The result of the first effort to secure legal protection against the spread of the yellows was the law of 1875. But for reasons to which I need not refer, it was made applicable only to Van Buren, Allegan, and Ottawa counties. With such

a law for such a purpose, very little could be accomplished. The people, however, in the peach growing districts, were being educated by the agitation of the question and by the devastation of their orchards to demand another law of wider application. In answer to this demand, we have the law now under discussion [law of 1879]."--Rev. J.F.Taylor, Saugatuck, Dec. ~~19~~, 1879, before the Annual Meeting of State Hort. Soc. at Allegan. Ibid. p.211.

Report of Yellows Commissioner B.D.Williams for year 1879, for South Haven.--Ibid. p. 213-14.

Trees at a distance from diseased ones are as likely to be affected as those near.--T.T.Lyon. Ibid.p. 273.

Profits of peaches in Allegan Co., in 1879. "We read of a man who got $1,000 for the peaches on less than four acres, without the trouble of picking or marketing them; of another whose sales from an orchard of ten acres amounted to $4,700. Senator Lewis has good cause to estimate the value of the peach crop of the lake shore towns at $200,000 and of the town of Ganges alone at $50,000 to $70,000, and no one ques-

tions this." * * About $45,000 was paid out for peaches in the vicinity of Fennville.--Allegan Journal quoted. Ibid. pp. 348-50.

Profits of peach orchard of a little less than four acres owned by Geo.T.Lay, Allegan Co.

1874 - - repaid cost planting.

1875 - - no crop.

1876 - - $300. and home use.

1877 - - $500.

1878 - - $800.

1879 - - $1,000. Did his own picking.

1880 - - $800. Reserved some trees and sold fruit on rest.

Mr. Lay's own statement. Mich. Hort. Rep. 1880. p.276.

A. G.
Mr. Gulley says that every healthy bearing peach tree is "as good as or better than five dollars permanently invested at 10%." * * "At least 5,000 trees have been destroyed by this disease [yellows] the past season [1878] in this county alone[Van Buren]" * * "No variety is exempt from the disease. Seedlings suffer the same as budded fruit." * *

"Situation or soil seem to make no difference, wet or dry, exposed or sheltered, rich or poor, clay or sand." * * "We have good reasons for accepting the theory that the yellows is something within the tree itself which develops and is given off by it." * * "I have yet to see or hear of an infected almond tree." A.C.Culley. Dec. 1878. An.Rep.Secy. Mich.St.Pom.Soc. 1878. p.249-53.

"The disease is supposed to have been introduced in this vicinity about the year 1862,* by means of trees imported from New Jersey, which had been grown from the buds of infected trees. But few trees were so affected, and it was several years later when the disease in the vicinity of Benton Harbor first assumed a contagious type. A few tres in the large orchards south of St.Joseph showed signs of yellows, but the character of the disease being known, such trees were immediately destroyed, and many fine crops were grown before the trees were all affected. The area of the country infected was comparitively small until the past two seasons [1878 and 1879], when the disease has assumed a more violent character, and has spread over all of Berrien Co., excepting a small portion of the extreme southern part, and has destroyed many

* wrong date - showed to 1866 — So says Mr. Brown himself in answer to my inquiry.

fine orchards in Van Buren Co., [1878], although some localities have but recently shown incipient signs of the disease." --W.A.Brown, An.Rep.Secy.St.Pom.Society,Mich.,1878. P.254.

"The fungus found upon the roots of decayed peach trees, is indigenous to all dead and decaying woods. * * Many thousands of trees which have been stricken by the disease, have been removed by 'drawing out'; and the crown and roots of such trees invariably show a sound or healthy appearance." Ibid. p.254.

"Young trees which are perfectly healthy soon become infected when planted in the vicinity of diseased orchards." Ibid. p.255.

"A Gentle~~man~~ maw to the peach 'manor born',--in Monmouth Co.,N.J.,--but who has resided in this vicinity during the past ten years [since 1868], informs us that he has ~~not~~ witnessed the destruction of peach orchards in these localities during the past thirty years. First in Monmouth Co.,, about 1850, the yellows made its appearance, and culminated in the destruction of the peach orchards about 1856. Monmouth Co. and

vicinity were famous in their day, having often glutted the eastern markets with peaches. Driven from the Atlantic Coast Counties by the yellows, the prominent peach growers of New Jersey located in Morris and other counties in the north of the State, where peaches were grown successfully until about 1867, when New Jersey peach grwoers were again driven by the yellows to 'fresh fields', favorable localities in Delaware and Maryland, being chosen, from whence the eastern markets have received their principal supplies during the past few years. Incipient signs of yellows have appeared in Delaware and Maryland, and it is evident that a 'change of base' will soon become neccessary."--Ibid. p.256.

"We have evidence that localities which have been entirely devastated by yellows, are being enabled to grow peaches again, after a lapse of time varying from ten to twenty years. Monmouth Co., N.J., is planting large orchards, and all signs of disease have disappeared."--Ibid. p.256.

"There is no longer any more doubt about the peach yellows being caused by root fungus than there is that the sun shines on a clear day. I fear your friends have not kept pace with the progress of discovery."--Thos. Meehan, Nov.8, 1878. p.257. Same Report. Letter to C.W.Garfield.

E.M.Potter thinks yellows has never done much injury on "limestone" soils.--Ibid. p.257.

"Last season [1877] I received trees from Georgia, one of which shows unmistakable signs of yellows, and the second stage of the disease [sprouts], the tree having never blossomed."--T.T.Lyon, Ibid. p.258.

"I have never seen a terminal bud exhibit this unhealthy growth."--Gulley, Ibid. p.258.

"The yellows once swept over New England in such form that no peaches were raised for five or six years; then trees were started, and in about fourteen years from the first raid of the yellows it came again and cleared the country of peaches."--Mr.Hanford. Ibid. p.258.

[Prof. Jos. Sullivan knows Mr. Hanford, & says he is apt to make careless statements]

"The orchards at St.Joseph where no means were taken to check the disease, were used up pretty thoroughly in four or five years. In others where radical measures of extermination were adopted this length of time was doubled.--A.A.Olds, Decatur. Ibid. p.259.

[Yellows was very bad in South-western Michigan, in 1877-8. Examine records to determine whether these were wet seasons.]

[Does the disease remain in a locality when it has once appeared, i.e. become ~~epidemic~~ endemic?]

Full text of law of 1875 on pp.155-157. Rep. Secy. Mich. State Pom. Society, 1876.

It covered three counties: Allegan, Van Buren, and Ottawa. p.726. Loc. Acts, 1875.

At meeting of Am. Pom Society, Chicago, Sept., 1875, Thos. Meehan read a paper on "Fungi and Fruit Diseases" in which he treats of yellows. Says various things may cause it. Fungi etc. Apparently he did not then have any clear notion of the disease. p. 309. See whole paper in Rep. Secy. Mich. State Pom. Society. 1875. pp. 307-310.

On page 496 of Mich. Pom. Rep., 1874, mention is made (Aug.22) of a peach tree near South Haven which (last year, 1873) bore two premature peaches "on the end of a limb, which limb was removed as soon as the peaches were discovered to be

diseased. On a recent examination this tree was found to be covered with diseased peaches, and several others in the neighborhood were likewise found affected in whole or in part."

Browne's Trees of America. Cf.

Noyes Darling, of New Haven, Conn., described the yellows quite fully and correctly as to main symptoms, in 1845, in Albany Cultivator, second number. p.14. Mich.Pom.Soc., 1873.

Inoculation experiments that succeeded. Ibid. p. 15.
[Noyes Darling's]

"Yellows appears to be of American origin; we cannot find that it is known in other countries.--J.C.Holmes et al. Ibid. p.19.

[Not correct title]

Floy's Orchardist, N.Y., 1833, speaks of yellows as a disease to which peach trees are subject "of late years." It speaks of trees bearing premature fruit. Ibid. p. 20-21.

"The Orchardist," Boston, 1833, says the disease is not known in New England. Ibid. p. 21. [Probably an Early Edition of Kenrick's Book]

Almonds are said not to blossom at same time as peaches. Ibid. p.496.

[Do diseased trees blossom earlier than healthy ones?] Yes, 1890.

H. E. Bidwell of South Haven gives the peach product of Van Buren Co., after correspondence with a hundred of the largest fruit growers, as follows:

Year,	Acres set, A. in bearing.	Bushels,	Total.	Total pr. A.
1872	945 315	62,929	$94,393	$300.00
1873 (Tp. of So. Haven.)	69	9,072	27,296	431.68
1874	420	84,100	126,150	300.00

Re examine these Statistics

[Was this for entire county?]

From amount it would seem only for the township.]

"The average net per acre for the last three years [1873-3, and 4] * * for peaches [was] $343.99." This is for Van Buren Co. Mich. Pom. Rep. 1874. p.511. [Small acreage]

[Try following experiment: remove all the blossoms from at least twenty trees healthy in an infected orchard for several years in succession.]

A.R.Nowlen, of Benton Harbor, says, [April, 1873,] "I think the disease made its appearance five years ago [1868] for the first time and in various orchards several miles distant from each other and simultaneously." Ibid. p.22.

L. Collins of St.Joseph [April 2, 1873] says: "We have the disease called the yellows without any doubt among our trees, and that to an alarming extent. I have lost one orchard of eight hundred trees entirely by the disease." Ibid. p. 23.

J.E.Chamberlain, [April 12,1873] says: "If premature ripening of fruit is the evidence of the disease termed yellows, then this disease extends North and South, through all the fruit belt of Michigan." Ibid. p.23.

See additional facts in the same paper. The people there thought exactly as they do to-day in Maryland and Delaware, that the disease could not be yellows. And yet it was.

"In the orchard of John T. Edwards diseased peach trees grafted on plum stalks were entirely destroyed by the yellows without injuring the root at all; below the graft the live healthy root sent out strong plum stalks."--Ibid. p.26.

Mr. Chamberlain says there are "not less than 600,000 peach trees by actual count in that part of the South Michigan fruit belt which finds its outlet at the mouth of the St.Joseh River."--Ibid. pp.26-7.

Mr. T.T.Lyon, of Plymouth, in his reply to the Com. said: "It [the peach disease in his vicinity] is undoubtedly not the yellows." "Our oldest peach orchards are not far from twenty years of age."--Ibid. p. —

The committee, consisting of J.C.Holmes, H.G.Wells, and S.C.Knapp, from whose report, pp. 11-37, I have been quoting, found yellows only at St.Joseph, Benton Harbor, and South Haven [July 30-AuG. 7, 1873]. They saw no yellows north of South Haven nor much anywhere--only here and there a few trees. They apparently went too hastily.

"They do not have it [yellows] in Europe."--Chas. Downing, April 24, 1873. Ibid. p.38.

Mr. Bidwell is authority for the statement that not even the almond is free from the yellows. Ibid. p.253.

[Ask Mr.B. to substantiate his statement.]
Skipped the country

Mr. Nowlen, of Benton Harbor, said that yellows was first discovered in Benton Harbor seven years ago [i.e. 1866]. Ibid. p.253.

Messrs. Cook and Bidwell found yellows in 1872 more or less "in every direction from Benton Harbor extending north as far as watervliet and Paw Paw Lake. The disease has probably existed in the vicinity five years [i.e. since 1867 or '68]. The exact time of its advent is not known. The people have tried to believe it was not the'yellows' but the result of peculiar soil or seasons. But the fact can no longer be concealed. They have 'the yellows' in its most aggravating form."--An. Rep. Secy. Mich. St. Pom. Society, 1872. p.277.

"The peach tree is very extensively cultivated throughout New Jersey."--T. Hancock, Burlington, N.J., Jan. 1841. p.90. Magazine of Horticulture (Hovey's), Boston, 1841. No mention of yellows.

[Peach yellows is moving south in Maryland and Delaware, at present.]

Get direction of the prevailing wind at Wilmington.

A.C.Glidden, of Van Buren Co., Mich., thinks the disease spreads in the direction of the prevailing wind from diseased trees. I doubt this! He says the disease started at St. Joseph, and spread east fifty miles in the time it was going ten miles south. Says it has progressed at the rate of one township a year. p.379. Condition of Growing Crop. 1887. Dept. of Agric., Washington, D.C.

Mr.A.C.Winchester, of Lake Shore Nursery, St.Joseph, says: "It made its appearance here eighteen years ago [i.e. about 1869]. We do not know where it came from, or how [it was] introduced."--Ibid. p.378.

"The only fact in regard to its being communicated from one tree to another is that where one tree is attacked in an orchard it will spread in from three to five years to every tree in the orchard. I have never seen it eradicated after the first trees were attacked, either by cutting out diseased trees or by any other remedy, until all were gone. The disease first appeared in the centre of the peach belt eighteen years ago, and gradually spread north and south along the lake shore until there was not a healthy orchard left, and but very few trees were set until five or six years ago, when

several orchards were planted that are healthy now, while orchards set fifteen years ago would all be diseased before they were four years old, so that it is not as bad now as when it first came."--Ibid. p.379.

N. W. Lewis says it cannot be cut out.--Ibid. p.378.

Yellows has been at Lawton, Mich., nine years, i.e.since 1879.--Hon. C. D. Lawton.--Ibid. p.377.

"The disease of the peach tree known as yellows is common in this locality, and has been more or less so for the last ~~fifteen~~ twelve or more years."--T.T.Lyon. Ibid. p.377.
[Common since 1875]

Yellows on new land. Ibid. p.379.

~~Ask for Black's book.~~

In 1852, the yellows was described as the disease "which for thirty has killed off the trees by thousands."--The Plough, Loom, and Anvil. Vol.V. Part I. N.Y. and Philadelphia, 1852. p. 347.

See Report of Committee of American Pomological Society, September, 1852, at the Philadelphia meeting.

The following items are from a synopsis of this report, in the Plough, Loom and Anvil. Vol. V. Part II. pp. 37-40:

"It is notorious that the yellows mentioned was first introduced there [near Rochester, N.Y.] in trees imported from New Jersey."--p.38.

"Peaches have done but ill with us [Pennsylvania] for some years past [before 1852]. The yellows has swept off thousands of trees."--p.38.

"The trees have succeeded here [in Virginia] well--many of them thirty to forty years old. The yellows appears in some places, and where no means are used to check its progress, it has destroyed some orchards entirely."--p.38.

Some attention was given to peach culture in Michigan in 1852.--p.39. No yellows--young orchards perfectly healthy.

"In New Jersey and Delaware [1854] it is necessary to renew the peach orchard every five or six years.--p.359. Vol. VII. 1854-5. The Plough, Loom, and Anvil, N.Y.

For reference to Jas.W.Thompson's paper on date of peach growing in Delaware [1832], see also The American Farmer, Baltimore, 1846,, pp.27-29. He speaks of yellows as "a constitutional, consumptive, or marasmatic disease, * * by far the most destructive enemy of the peach tree."--p.29.

As long ago as 1848, New Jersey peach growers talked of yellows as the result of bad treatment and soil poverty. The Am. Farmer, Baltimore, 1848, p.87.

T. W. Harris, the Entomologist, saw yellows in his garden in Mass. in 1854. He says: "For the first time in eleven years the symptoms of the disease have appeared in my garden. It is confined to two branches on the north side of one peach tree, the fruit of which is becoming red some three or four weeks too soon, while a few wiry shoots, clothed with diminutive and pale leaves, have sprouted upon these branches. Neither borers nor the Tomicus luminaris have been discovered in the tree; and the cause of the disease remains as much a mystery to me as to other cultivators. * * In former years peach trees have rarely suffered from yellows in this

neighborhood [Cambridge, Mass.] where now [1854] many trees are affected with it."--Remarks on Some of the Diseases and Insects affecting Fruit Trees and Vines. pp.231-35. The Am. Farmer. Baltimore, Md., 1855. See also Proc.Am.Pom.Soc. 1854 (Boston meeting) p.212?

Two well authenticated cases of appearance of nectarines on peach trees. The Am. Farmer. Balt., 1876. p.289. In one case, that of Col. Edward Wilkins, Kent Co., Md., the trees were Hale's Early. See also Ibid., p.347.

"The Cassidy Peach Blossom Farm, situated in Sassafras Neck, Cecil Co., Md., was sold on the 3rd, ult., [Jan. 3, 1857, or Dec. 3, 1856] at auction. The farm contained 663 acres, and sold for $51.50 per acre or $34,144.50, Mr. Anthony Reybold, of Delaware, purchaser. Mr. R. already held the farm at $6,600. rent for the current year, and has realized $10,000 from it, besides a valuable wheat crop now growing."--p.223. The Am. Farmer, Balt., Md., Jan., 1857.

In Sept.,1859, Mr.Reybold expected to realize "over $30,000." from his orchard on Cassady Peach Farm, ~~Kent Co.,(?)~~ Cecil Co., Md. p. 94. The Am. Farmer. 1858, Balt. Md.

Round Top farm lies on Chester River, two and one-half miles above Chestertown, Md., Ibid., p.178.

"The peach in Georgia is perfectly at home; the yellows is unknown at the South--I have never seen a case of it here." J. Van Buren, Clarksville, Ga., 1858. Ibid. p.250.

The Round Top farm is on Chester River, in Queen Anne Co., Md., owned by John Harris. "The peach orchard is the great feature on the farm. It extends along the river bank for an unbroken stretch of one and seven-eights miles and is a mile deep; 1,013 acres of peaches are here growing and bearing in this one orchard [1871]. Nine years ago the locality was covered with the native forest." All the peaches were canned. "The quantity put up this year will be about a million cans. The daily work was about four ~~million~~ thousand baskets or 30,000 cans."--The Am. Farmer, Balt., 1872. p.62. From Wilmington, Del., Commercial.

James Tighlman of John has about 15,000 peach trees; and Mr. Blanchard Emory has 4,000 trees [1872]. "Queen Anne is not so extensively interested in peach growing as Kent, but most of her farmers have market orchards". — No mention is made of yellows. Account of visit to Mr. Tighlman, Queen Anne Co., Md. The Am. Farmer, Balt., 1872. p. 247-8

Cf. Report of Cyrus Thomas, St. Entomologist of Ill. on Plant Lice , 1877 or 8.

Prof. T. J. Burrill says (Tr. Ill. St. Hort. Soc. 1880 p. 165) in a paper on "Pear and Apple Tree Blight" that:

"So far as my examinations show, this is also true of the peach yellows, [i.e. that roots do not blight]. The roots sent me were certainly free from disease, while the bark and pith of the parts above ground were full of bacteria."

"Pear blight and Peach Yellows" by T. J. Burrill, pp. 46-49, Tr. Ill. St. Hort. Soc., 1883.

Prof. B. says: "Three distinct lots of specimens were received [from Detroit and So. Haven, Mich.], and after a careful examination of them it seemed to me that the conclusion was warrantable that the cause of the well-known contagious was an organism found in the affected tissues, not very unlike that of blight in the pear. This conclusion appeared in public print, perhaps prematurely." * *

Prof. B. follows with some excellent statements, and disclaims any definite opinion on this subject.

"I know some [peach] trees now that are 40 years old."-- Mr. Augur, of Conn. p. 200, 13th An. Report N. J. Bd of Agric. 1885. [Ask him where they are].

"In pear blight it is easy to discover the bacteria. Any one

can see them in the mass with the naked eye, as I will explain later. The same appearances as to bacteria cannot be obtained with the peach yellows. Careful examination of trees affected by this disease reveals no bacteria in quantity; I do not say that bacteria may not cause the disease, but there is no such abundance of them as in pear blight. If they occur in yellows it will require special manipulation to demonstrate them as it does in consumption; they certainly are not abundant and easily found." Ibid. p. 199. -- J. C. Arthur.

"Duration of bearing [of peach trees in Hunterdon Co., N. J.] from 5 to 7 years from commencement [at 3 to 4 yrs. from planting]. This will vary from several causes, such as variety of soil, exposure etc., some orchards bearing for 10 yrs., some not giving more than 3 or 4 good crops."-- Thos. C. Haywood, of Flemington, N. J. in Rep. N.J. St. Bd. of Ag. 1877 p. 129.

(Pomologist) of Middlefield Conn.

P. M. Augur in 20th Annual Rep. Conn. Board of Agric., 1886, says (p. 345):- "Dr. Hape, of Georgia, has assured me that the yellows did not exist south of the Potomac river, and yet I think I found genuine symptoms of the disease in Tennesee.** Of all localities on our globe for successful peach culture probably none excell the region between the Chesapeake and Del. Bays.** Delaware orchards certainly exceed ours in longevity and productiveness." [No longer true for Kent Co. Newcastle and

Analysis of peach wood in An. Rep. of Conn. Agric. Exper. Station, 1884, p. 94. Analyses apparently made by or under direction of Dr. E. H. Jenkins, Ph.D.

On pp. 77 - 80 of Report Conn. Bd. of Agric. 1884-5 is an interesting discussion of peach yellows. Mr. J. H. Hale, of South Glastonbury, Conn. said: "When we first commenced planting peach trees on a large scale, 4 or 5 years ago, I had seen an account of Prof. Goessmann's experiments at the Ag. Col. at Amherst, and I made up my mind to follow the potash theory out to the end of it. At the time of our planting the first trees, the whole ground, some 5 or 6 acres, was manured with about 800 pounds of muriate of potash to the acre (probably a very heavy and unnecessary application), except on one field near the house, where some 200 trees were planted. No potash was applied there. Every year since all of those orchards have had from 5 to 6 hundred pounds of muriate of potash per acre applied, sometimes in the fall, sometimes in the spring, and this plantation of nearly 200 trees, near the house , has never had any potash until this last season, in the spring [Spring of 1884]. They were then 5 years old. Of the 5,800 trees [can it be possible to put all those on 6 acres?] where the potash has been applied for the last 4 or 5 years, there is just one tree that shows any trace of the yellows, and of the 200 trees that have not had an application of potash, over 30 per cent

+ In 1891 Mr. Hale brought to Mr. Van Deman samples of what his orchard could do in the way of peaches. One was given home, and I expected something fine, but was surprised to find it a

of them are dead with the yellows, and at least 20% of the balance show traces of the yellows. I do not know that the potash has saved the trees, but that is the fact. [Does he know the disease? Visit this place in 1888 and make a personal examination.]*

promising + worthless fruit - quite red & spotted," 1878.

Mr. Rodgers agreed as to value of potash,-- "where I used potash abundantly and manured well besides, those trees have lived and done well, and the trees which I have lost by the yellows are invariably those to which the least potash has been applied." p.78.

In discussion on peach yellows (Report Conn. Bd. of Agric. 1883-4, pp. 74-6, Prof. J. W. Clark, of Amherst, says he has seen a tree cured of yellows by Prof. Goessmann, but adds, "The experiment so far has been successful [Jan. 1884] but I do not think it has gone far enough to enable us to say that you can take any tree which shows signs of yellows and save it." p 75.

Referring to aphis as a possible cause of yellows, Mr. Augur says, "I feel pretty sure we have not been troubled in that way." p.20, Rep. Conn. Bd. of Agric., 1884.

Ib. p. 25, A Hudson R. peach grower is said to have used Penhallows' formula with entire success. Ref. also on p. 26 to similar results in N. J.

In 1875 Mr. Augur notes "the prevalence of the 'yellows'" in Conn. p. 248, Report Conn Bd. of Ag., 1875.

"In the first quarter of this century the peach was raised in

Conn. with success. The fruit was common and abundant . Since then it has been a rare fruit"-- P. M. Augur. p. 332. Report Conn. Bd. of Ag., 1872.

"A majority of the peach trees in the country [1851] have been destroyed by the Yellows.** Trees affected by the Yellows ripened their fruit prematurely." Wm. G. Waring, Centre Co., Pa. Rep. of the Com. of Patents. 1851, p. 242.

No fruit of any consequence was raised in Sussex Co. Del. in 1851. Ibid. p. 264.

Thos H. Genin reports destruction by yellows of nearly all of a 600 tree peach orchard belonging to A. W. F. Genin at ST. Clairsville, Ohio-- 1849 to 1851. Ibid. p. 369.

Another Ohio man says (p 378): "Our peach trees are somewhat affected with the yellows" [Richland Co.]. Ib. p. 378.

Geo. P. Fisher writing from Dover, Del. in 1852, implies that Peach Yellows is present in Kent Co., but not so common as to attract much attention where diseased trees are dug out and burned. He describes it so that there can be no doubt of what he is speaking about. He advised prompt removal and burning. Thinks the disease can be prevented but not cured. Ib. 1852, pp. 112 - 113.

"The Yellows are destroying our peach trees,"- Jno. L. Yoemans, Columbia, Conn. Ibid. p. 166. He knows no remedy but to dig out.

"The Yellows is unknown among us. [Onondago Co. N. Y.]" Ibid. p. 198.

Analysis of diseased and healthy peach trees by Prof. Emmons of Albany N. Y. Patent Office Rep. 1849, p. 479-480.

"A day at the Reybold's in Peach Harvest [Aug. 29, 1845]." James Pedder in Boston Cultivator. quoted in An. Report Com. of Patents, 1845, p. 954-955. Shows extent of peach business in New Castle Co., Del., in 1845. The shipments to Phila. this day by the 5 Reybolds, were 5420 baskets of 3½ pecks each.

"From the books of Major Reybold and his sons was ascertained the quantity of peaches sent to market to the 29th of Aug. [1845] inclusive, viz:

Major Reybold from his Md. & Del. orchards---	31,145	baskets
Jno. Reybold ----------	13,300	"
Philip Reybold, Jr. ----------	6,000	"
Wm. Reybold ----------	5,699	"
Barney Reybold ----------	7,200	"
Total ----------	63,344	baskets "

The number of acres they had in orchard was 1,090; number of trees 117,720. "Mr Philip Reybold, Jr. is extensively engaged in the nursery business more particularly in the raising of peach trees of which he has from 60,000 to 80,000 from seed of the present season." [It seems peach growing was a large industry in this Co. as early as 1845]

"The peach crop of this year [1848] has been very large.** The Delaware crop is estimated by our intelligent correspondent at 500,000 bushels [baskets?]" p. 164, Rep Com. of Patents (Agric.) 1848. See also p. 465 where the correspondent himself, J. Jones, says, "baskets" # and that the Reybolds' must be credited with 125,000 baskets.

"Peaches were very abundant in Del., N. J., and Pa. but there were very few in the region bordering on the lakes [in 1865]." p. 4. Appleton's Annual, 1865.

Peach crop was deficient except in West and South in 1868. Ibid., 1868.

"Peaches were very plentiful." Ib. p. 6., 1869.

"Peaches were not abundant nor of very good quality." Ib., p. 12., 1873.

"Peach crop was below the average especially in Md. and Del. [in 1874]." p. 7. Ib. 1874.

P. were abundant in 1875. Ib. p. 9., 1875.

De Candolle thinks the peach originated in China, Appleton's Cyclop. Art. "Peach" Cf. also Darwin's Plants and Animals under Domestication.

According to Geo. Thurbur ("Peach" in Appleton's Cy.) there were in 1875 peach trees in Va. 70 yrs. old.

"In California the production [of peaches] is immense." Thurbur, Ib. 1875.

Article in 9th Ed. of Ency. Brit. 1885 by M. T. Masters says there are two views as to the origin of the peach. A. De Candolle's that all varieties came from an original species native probably in China, and Knight's view, supported by Darwin, that the peach is a modification of the Almond. "The peach is not known as a wild plant in China or Japan" M. Masters inclines to the view of Knight and Darwin.

Knight obtained peaches from an almond by crossing with peach pollen, part on the tree were peaches the rest almonds.

In the valley of the LaPlata the peach tree is said [Johnson's Cyclop.] to be grown for fuel.

De Candolle in Origin of Cultivated Plants (1882) Eng. Ed. 1884 P. 227 - 229, modifies some of his earlier statements, but still opposes Knight's view (supported by Darwin), that the peach is derived from the almond (arguments botanical and experimental) and maintains that peaches are essentially Chinese (arguments chiefly philological). Several varieties have there been cultivated for thousands of years. Tao (peach) occurs very early in chinese literature, no word in Sanscrit for peach, no reference to peach in early Hebrew writings, or Persian (?)

"Les Pechers y sont [in Lousiana on the prairies] semblable a ceux de l'Europe, et y portent de tres-bons fruits en si grande abondance, que les Souvages sont souvent obligez de les soutenir avec des fourches." Louis Hennepin p. 300. Nouvelle Decouverte d'un tres grande Pays situé dans l'Amerique, entre Le Nouveau Mexique et la Mer Glaciale, etc. Utrecht. 1697.

Hennepin traveled in Am. "depuis l'an 1679 jusques en 1682" He Mentions having found the peach along with other trees. ~~(In~~ (in another part of his book).

"In the month of May 1796, the society [Am. Philosophical], in order the more effectually to answer the ends of their institution, agreed to appropriate annually, a part of their funds to be disposed of in Premiums to the authors of the best performances inventions, or improvements, relative to certain specific subjects of useful knowledge. The following premiums were thereupon proposed:-" p. IV. of Advertisement.

* * * *

V. "For the best method verified by experiment, of preventing the premature decay of peach-trees,-- A premium of sixty dollars.

"Papers on this subject will be received, till the first day of January, 1798."-- p. V. of Advertisement. "Transactions of the Am. Philosophical Society, etc." Vol. IV. Phila. Thomas Dobson, 1799.

On page VI. it is stated that: "A number of papers have been

—— received on the several subjects above stated," but no premium was yet awarded except on "the best system of liberal and literary instruction etc."

Vol. V. of same Trans. states that the premium was divided between two persons, and in the Appendix p. 325-328 their brief papers are given:-

(1) "Account of a Method of Preventing the Premature Decay of Peach Trees. By John Ellis of N. J." This author attributes the decay entirely to " a worm which originates from a large fly, that resembles the common wasp; this fly perforates the bark and deposits an egg etc."

(2) "Description of a Method of Cultivating Peach Trees, with a view to prevent their premature decay, confirmed by the experience of Forty-five years in Delaware state and the Western parts of Pennsylvania. By Thomas Coulter, Esq., of Bedford Co. Pennsylvania." Mr. C's view is as follows:-

"The death of young peach trees is principally owing to planting, transplanting and pruning the same stock, which occasions it to be open and tender, with a rough bark, in consequence of which insects lodge and breed in it, and birds search after them, whereby wounds are made, the gum exudes, and in a few years the tree is useless." p. 327.

[No mention of any symptoms like yellows in either paper]

Mr. C. cuts back his trees and gets new shoots. He says- "I have

now trees from one to thirty-six years old, all from the same stump."

Nicholas Collin, Rector of the Swede's Church at Philadelphia read before the Am. Philosophical Society, Jan 19, 1816, a paper entitled- "Observations made at an early Period on the Climate and Country about the river Delaware, collected from the records of the Swedish Colony by Nicholas Collin" in which he says:-

"He [Campanius] mentions peach trees as growing, [1643- 1648] among others, in several places. It is very improbable that they had been planted by Europeans. The remarkable abundance and variety of this valuable tree, before their decay for the last 30 or more years [prior to 1816] proved their congeniality with the climate."

Thos. Campanius spent 5 years in the vicinity of Delaware river 1643 to 1648, as a missionary among the Delaware indians, and published at Stockholm in Swedish in 1702 in 4to. "A short account of New Sweden" a copy of which (Swedish) was in the public library of Phila. in 1816. The first important settlement was "about the place where Wilmington now stands" early as 1638 or before.

Cf: paper on "Yellows" Mich. Pomological Rep. 1878. p. 256.

W. K. Higley Am. Nat., 1881, p. 857, says Yellows appeared

Probably a misprint for '67.

in Michigan about 1857 [what authority for this date?]

"Incipient signs of yellows have appeared [1878] in Del. and Md." -- Mich. Pom. Rep.

A great mixture of sense and nonsense is Mr. W. K. Higley's paper "On the Microscopic and general characters of the Peach tree affected with the 'Yellows'" Am. Naturalist, 1881 pp. 849-857 and 961 - 976. He attributes the disease in part or whole to a fungus which he finds in fruit and various parts of tree and he describes and figures it as "unicellular, branching and much enlarged in places" and says it "reminds one of Saprolegnieae, to which division of fungi this form seems to belong." [Work seems to have been done at Univ. of Michigan]. [From the crude drawings it is difficult to guess what Mr. Higley had under observation - Probably mycelium & monilia]

It was done there but not under Prof. Spalding

"About Wickon's Sippus, or Pike Creek, there grew a great many peaches and grapes and in the meadows calamus roots" p. 52, Campanius. Trans. (by P. S. DuPonceau, LL.D.) of Swedish Ed of 1702. Phila., 1834. He also mentions "several sorts of plum trees". Campanius (P. 53) also speaks of "a large and horrible serpent called a rattle snake. It has a head like a dog, and can bite off a man's leg as clean as if it had been hewn down with an axe." Says they are 3 yards long.

"Between Memirsko and Makles Creeks [a number of miles N. of Bombay Hook on N. J. side] there grew great quantities of walnuts

chestnuts, peaches, damsons, cypresses, mulberry, fish trees, and many other rare trees." Ib. p. 47.

[New Sweden extended on both sides of Del. bay and River to above Phila.]

"There is a great variety of trees in this country of which the following are the principal:- filbert, chestnut, walnut, box, mulberry, cypress, mucated vine, apple, pear, cherry, plum, damson, and the fine sweet smelling sassafras; there are also peach trees etc." Ib. p. 40. [Campanius appears to have been an honest but credulous man. See Snake story.]

A note in Am. Jour. Sci. & Arts, 1st. Series Vol XI. 1826, quoted from N. Y. Evening Post says "the cause of the decay in our peach trees" is the borer and describes its habit.

"As the delicious fruit of this tree [peach] has become of late years very scarce in some of the Eastern states, by means of the peach tree decaying and finally dying; and as I have for some years in New Jersey and this state [Ohio] been anxious to find out the cause; and having ascertained to my satisfaction that it was not owing to a worm at the root as some have affirmed,- I have etc." From the Cincinnati Gazette. Quoted in Niles Weekly Register, Baltimore, Md. June 15, 1816.

Mr. James Wood, the writer of the letter, dated May 16, 1816,

Columbia Township, goes on to say that he finds a small insect [1815 and 1816] on the young shoots of the peach in April both years in great numbers. He says: "I observed these insects for sometime, in which they increased very fast." He also says "I have thought proper at this late hour, to make the following statement of my own observations, especially as I have with much sorrow perceived the peach trees in this state are becoming subject to decay:-

"These insects appear as the first growth begins to put out in April. They increase till they became very numerous. They are very small at first, remain for the most of the time on the under side of the leaf, and cause it to twist and turn a pale yellow color. In a short time they turn to a small fly and disappear. There are none to be seen after the 10th or 15th of May. They somewhat resemble the lice on cabbage or broom corn. ** Query. do these insects poison our peach trees and bring on this decay"- p. 262.

On use of peach trees for fire wood in Buenos Ayres.- Country Gentleman, p. 211, 1858. Quoted from California Farmer, whose Editor says: "Those who have been to the B. Ayres country will easily remember that the principal firewood used is peach wood, and the vast plains beyond the city and fort are one wide-extended peach forest, the trees grown principally for fire-wood, and so rapid is

the growth of the peach tree, that nothing can be more profitable and there are those now in that country who have made fortunes by this business. The trees grow rapidly, bear abundantly; the fruit is used for swine and for drying and shipping. Such a similar kind of business do we look forward to here in Cal." He says the peach grows rapidly in Cal.

In The Country Gentleman, Albany, N.Y. for July 22, 1858, p.42 in Editorial Correspondence is an account of a visit to Newcastle Co., Del., from which we extract the following relative to peaches:-

"We came to the residence of Wm. Reybold, Esq., not far from Delaware city, who here occupies a fine estate of 460 acres, and has another farm within a short distance, of 375 in addition. His orchards formerly sent 5, 6, & 7 thousand baskets of peaches a night to New York for a period of about six weeks, employing several steamboats for the purpose; and 70 acres,- 30 of them in 3 year old, and 40 in 4 year old trees,- one year netted their owner the handsome figure of $12,000. But the days of the peach in all these coasts seem to be numbered; their glory and profit have departed. Some mysterious disease [yellows] has for 5 years past [since 1853 or 4 according to this] kept them declining, and for the last two they have not paid. The ax has been laid at the root of their once fruitful and money bringing boughs, and, trunk and branch and twig, they are now being cut down and hewed to pieces for fire-wood!

"Is it not to the reflective pomologist, a melancholy fate?- to the lover of fruit a sad misfortune? Newly planted orchards on land where a peach tree never grew, seem to fare no better; they sicken, lose all their thrift, and apparently die by inches."

It was raining on the day of this visit so that the writer apparently did not enter the orchards.

On page 286, same vol. (1858) in answer to A correspondent who asks if this wide-spread peach disease is "Yellows" the reply is:

"The disease in Delaware may be yellows, yet as we do not know all the symptoms as developed there, we cannot speak positively. The yellows at the north is first indicated by a blotched and prematurely ripened fruit- then by small wiry shoots and a sickly growth-- then death. The yellows is quite contagious."

"Mr. Jacob Ridgeway has a farm near Delaware city, in this county, on which he commenced planting a peach orchard in the year 1831. A neighbor of Mr. R's gave us, a few days since, the following account of the condition and product of the peach plantation during the present year [1837]. In the 7 years which have elapsed since he commenced the plantation, Mr. Ridgeway has planted 140 acres- 100 trees on the acre. The produce of the present year is estimated, by our informant, at 100 baskets of peaches per acre, or 14000 baskets of peaches. The peaches of which he presented

us some specimens are of the finest kind, large and of delicious flavor. Two schooners are constantly employed in transporting the fruit to the Philadelphia and New York markets; where, we understand it meets with ready sale at $3, $4 & $5 per basket. It is estimated that this peach crop will yield a profit during the present year of $20,000. We add to this statement that there is no part of our country which is more favorable to the production of this delicious fruit than the vicinity of Delaware city, and the whole district of country lying along the western shore of the Delaware and extending from Christiana down to Bombay Hook" [The very region from which yellows had in 1887 about driven out the peach]",- Quoted from Wilmington, (Del) Journal in Ruffin's Farmers' Register, Petersburg Va. 1837 (Dec), p. 459.

"We are happy to learn from Del., now becoming celebrated for its fine peaches, that although the cold weather and frosts have been most trying on the young fruit, and much of it is injured that there is yet enough spared to promise a fine crop if no future frost should occur to nip the tender blossoms just bursting from the bud. The great success of Messrs. Ridgeway and Reeves, near Delaware city will soon be followed by other equally enterprising gentlemen of Del. and this city [Phila.] who have gone largely into the business.

"On the Union Farms near Wilmington, owned we understand by Dr. Thomson of that place and Mr. M. Eayre of this city, we learn that about 100 acres immediately on the river Delaware are now flourishing in peach trees, and that about one-half will bear this year, and that by a late arrangement our esteemed fellow citizen I. Reeves, for whom peaches will always grow, has become a partner with these gentlemen in their large concern. Philip Reybold Esq., the efficient President of the Del. Ag. Soc., has also, we understand, set out this Spring a large orchard, * * * * * ——— Some of the fine peach districts of Jersey, seem of late years, [prior to 1838] to have lost their power of producing and continuing long-lived the tree that produces this best, in its season, of all fruits. We should like to hear from some of our Jersey subscribers, if they can give us the reason, why it is so- and if any clue has yet been found into that most insidious and fatal, disease to the peach tree, the yellows." Quoted from Farmers' Cabinet in Farmers' Register, Petersburg, Va., Aug. 1838, p. 261.

"The easy culture and rareness of disease in the peach tree in Western N.Y. etc.,"-- J. J. T[homas] in Genesee Farmer. Quoted p. 261, of Farmers Register, Petersburg, Va., 1839.

Yellows "commenced its ravages in Penn. and N.J. about the year 1797. Peach trees were cultivated near Philadelphia for more than a century before any such diseases appeared to have been

known; and in Western N.Y. more than 30 years passed away, after the Indian had resigned his old peach orchard to the white man, before it was introduced amongst us."-- From New Genesee Farmer, in Farmers' Register, Petersburg, Va. 1840, (Nov.), p. 665.

"As I have for about 30 years, [i.e. since about 1810] occasionally had my attention drawn to this subject [Yellows] I am willing to throw in my mite of experience. I am fully satisfied that the complaint exists. Some persons say that the worm at the root is the cause of the Yellows. I acknowledge that any disorder that destroys the trees will cause the leaves to turn yellow, but the complaint I call the yellows will kill a whole orchard, without any visible wounds, on or before the third or fourth full crop. I think where any neighborhood abounds with peach orchards, it will be nearly impossible to keep clear of the disease. * *

"I think I have ~~some~~ seen evidences of its being in some degree contagious. Richard Cromwell, the respectable and worthy peach raiser, near Baltimore, has for upwards of 30 years supplied that city with peaches of the best quality on a large scale. Sometime since when I was walking with Mr. Cromwell through his peach orchard, when the trees were hanging full of ripe fruit, he pointed out a tree that he said had the yellows, having a full crop upon it, and to me it appeared healthy; but he observed to me * * * as soon as I take the fruit from the tree, I shall dig it up, in order to prevent the disease spreading any farther, for I expect the

side of the adjoining trees next to it will be affected next season". I had occasion to pass through Mr. C's orchard the next fruiting time, and the sickly tree had been dug up, but, as had been predicted, parts of the four neighboring trees were evidently much affected but only the sides next to the diseased tree. * * *

"On another occasion I had a favorite early purple peach before I had a nursery, that I suspected was partially affected by the yellows, and being desirous of preserving the variety, I cut the healthiest branch I could get and I had 12 buds inserted in healthy peach stocks, but when they had grown about 3 ft. they showed the disease so plainly that in order to prevent it from spreading, I pulled up all the trees and had them burnt."--

Robert Sinclair, Clairmont Nursery [~~N. I.~~? near Baltimore, Md.], March 18, 1841, From Magazine of Hortic. Quoted in Farmers' Register, Petersburg, Va. 1841, pp. 357-8.

"The writer [Morris Longstreth, of Valley Green, Pa.?] had the pleasure of examining the extensive peach orchard of Major Reybold near Delaware city, in the month of May [1842]; at which time that enetrprising farmer had a prospect, as he stated, of about half a crop. It covered 120 acres of land, and contained 12,960 trees. His half a crop has produced 6,000 baskets [Sept. 1] which have been chiefly sent to the N.Y. market."--

Farmers Cabinet. Quoted in The Farmers' Register, Petersburg, Va., 1842., p. 478.

Letter from S. S. Bailey, of Grand Rapids, Mich., Feb. 1,1886 to N. J. Coleman, Com. of Agric., requesting an investigation of Peach Yellows.-pp. 9-10 An. Rep. Sec'y. St. Hort. Soc. of Mich. 1886.

Mr. Frank Hickok, of Allegan Co. "did not consider seedling trees as liable to yellows as budded trees"- Mr. H. G. Buck "found no difference" and says "A peach tree will seldom live over three years after being attacked by yellows." Ib., p. 370.

Eli Minch, of N.J., says; "I deem the man who contends that the yellows is a contagious disease a dangerous character," Ib. p. 529.

"The doctrine that yellows is not contagious is a dangerous one to teach"- G. H. LaFleur, of Mich. Ibid., p. 370.

California has a stringent law on injurious insects and contagious fruit diseases the text of which is given on pp. 5-6 An. Rep. Sec'y. St. Hort. Soc. Mich. 1885.

Fall text of Mich. Yellows Law on pp. 19-20, Ibid.

[Certainly if yellows does not now occur in California, the greatest care should be taken to prevent its introduction, even to the extent of State legislation strictly prohibiting the importation of peach trees from the Eastern United States. Unless such steps are taken the appearance of Yellows in orchards on the Pacific slope is only a matter of time.]

"It [yellows] has traveled within 75 years from the Atlantic to the Rocky Mts."- W. A. Smith, Berrien Co. Mich.- Ibid p. 318.

Diseased trees were permitted to stand and orchards were swept away when the yellows first appeared in Berrien Co.- The disease has advanced N. and E. most rapidly. W. A. Brown, Ib. 318-319.

Dr. Miles studied Yellows in Allegan and Van Buren Cos. p. 319, Ib.

In the 3 mos., Aug., Sept., and Oct., 1881, in South Haven, $112,724 was paid through the bank-- "nearly all for peaches". "I have examined for several other years and am satisfied that 4/5 of the money coming to this vicinity for the past 15 years for fruit or other farm products is from peaches, excepting the past year [1885] and the year of partial failure" C. J. Monroe, Ib, p. 349.

A strong article against shipping premature fruit. Ib., pp. 348-9.

"That dire disease known as 'The Yellows' is spreading through the peach orchards in the Western portion of our State, and under its malignant influence many of our finest and most profitable orchards are nearly ruined. We think we are now holding the disease in check, by promptly destroying the trees on the first manifestation of the disease. If, however, the yellows continues

to spread, it will be only a question of years when peach growing will cease on the lake shore." Joseph Lannin, of S. Haven, in 1883. An. Rep. Sec. Mich. St. Hort. Soc. 1884, p. 11. [Lesions not serious since 1883 C.F.S. 1890.]

Yellows from Ga. in young trees. T.T. Lyon. Ib., p. 177.

[No facts I could get at in Md. of Del. indicate that soil poverty has anything to do with yellows]

A.M. Purdy scouts soil poverty. Ib., p. 302.

N. Atwell, of Lawton, Mich. says it attacks trees on rich and poor land, cultivated or not,. He has seen it in young orchards on land covered four years previous with original forest. Ib., p. 302.

Opinion on the disease by G. H. LaFleur. Ib., pp. 390-91.

Cf. Do. A. Hamilton. Ib., p. 419.

"That dreaded scourge of the peach grower 'yellows' has made slow but marked progress during the year in this locality. The law has not been observed as closely as it should be in the matter of cutting and burning the trees at sight, nor yet in the shipping of partially diseased fruit. After all a great majority of the leading fruit growers fully believe that as a rule those who have cut out their trees at once as soon as discovered, have not only got the most trees left, but have for a term of years lost a much less percentage than those who have allowed their trees to stand through the season in order to pick what fruit they were able to obtain before cutting the tree down. A large majority

also believe that the disease can be kept in check if all fruit growers would dig out and burn all trees as soon as they discover the disease." [Cf. Dr. Henry Ridgely's experience] Sec'y Ramsdell (1882). An. Rep. Sec'y Mich. State Hort. Soc. 1882, p. 306.

Report of S. Haven Yellows Commissioner,

~~Com~~ D. B. Williams.

Year	No. Trees Exd.	No. with Yellows	%sick
1879	62,856	2,245	3½
1880	68,758	5,675	8
1881	71,353	3,256	4½
1882	120,425	4,544	4

Ib. p. 308.

[Ask T.T. Lyon for more recent statistics.] These are more according to Mr. Williams.—Postal, 7/6. 1888.

"We do not claim to have discovered a positive remedy for the disease called yellows, nor to have proved what the disease is." Prof. Maynard (1882), Ib., p. 343.

J. M. Asher, National City, Cal., (1872) "had never seen a case of yellows in the State." Ib., p. 344.

[Yellows has been cured by lime, potash, removal of infected limbs, hot water and hot lye on roots, hot soap, fish brine, bone-dust, wood ashes, etc. but in spite of all these ~~things~~ remedies the disease still sweeps away orchard after orchard.] Cf. Ib., p. 345.

"What we want is some scientific man to go into a country

like Berrien Co. in our State, where the disease, in spite of the employment of the best knowledge concerning its prevention, has cleared out the peach interest; then let him dig until he feels that he has something accurate and valuable to communicate, and until that time to hold his peace. Until some one in whom the public have confidence will do this we shall have no satisfactory solution of the problem." C.W.Garfield (1882), Ib., p. 347.

[The present "Yellows" law of Michigan is substantially that passed by the Legislature in 1881 (1880). There have been only a few verbal changes since then to render its workings more specific. This Act repealed the previous Act of 1879.]

[If the cause of yellows is climatic it ought not to appear in peach centers, but rather on border regions. The reverse of this is true. If yellows is a germ disease or due to insects it would be more likely to appear in centers and work outward. This is what we find.]

"Have we any new light on pear blight or Yellows?" a paper by Prof. T.J.Burrill read before An. Meeting Mich. St. Hort. Soc. Dec., 1881., p. 133-138. An. Rep. 1881, I make the following extracts:-

"I am still confident that the immediate cause of the disease called yellows is a living organism, so small that its presence has been overlooked by those who have studied the diseased tissues by the aid of the compound microscope." p. 133.

"The well demonstrated contagious nature of the disease points strongly to a something capable of growth and multiplication; no mere chemical poison or simple exhaustion with vital debility"-p. 134.

"Having for reasons stated expressed the conviction that the yellows is not due to the more highly organized parasitic fungi, which send their vegetative system through the internal tissues and produce their fruit or reproductive bodies only on the surface, we reach by exclusion the probability of bacteria-like organisms, and sufficiently account for their discovery now by investigators by their exceedingly minute size. Further such organisms have been found (by myself) in great numbers in two different sets of specimens [i.e. from So. Haven and Detroit]. Two lots of specimens ought not to be allowed to decide a matter of so much consequence and for myself these examinations would only be taken as a strengthening probability, did not the published accounts strongly support the results reached. Nothing can be clearer from practical experience than that the yellows is contagious, that the malady may be spread with the pruning knife or that it does spread in some way from diseased to healthy trees in the or-

chard.

"It is very doubtful as to the roots being in any special sense the chief ~~port~~ seat of the disease. In my specimens the roots were not infected at all, neither can we suppose the organism believed to be the exciting cause lives in the earth. The contagion is rather in the tops from which the roots as well may be infected." pp. 134-5.

Prof. Burrill says, Ibid. p. 135, that Lombardy poplars are much subject to pear blight and that the disease can be communicated from one to the other. Cf. previous statements of supposed relations of this tree to yellows. Page - 23,

"In Science for Sept. 25, 1880, p 162, there appeared an abstract of a paper read by me before the Am. Soc. of Microscopists at Detroit upon the blight of pear and apple trees. In this paper I expressed the opinion that the yellows of the peach tree would be found due to an organism similar to that found to be the cause of the pear tree blight. This opinion was based on my knowledge of the latter disease, upon the thoroughly confirmed contagious character of the yellows, upon the failure of competent investigators [Halsted, etc. probably], to find, after extended research, anything like the ordinary parasitic fungi. It was long ago conceded by entomologists that the disease did not arise from the depredations of insects.

"I am now able confidently to assert that this devastating disease of the peach is caused by Bacteria!

"These minute, moving, living things are found in great numbers within the cells of the diseased tree [Cf. Dr. Arthur's counter statement]. They are apparently specifically different from those of the pear tree, being comparatively more slender. What I take to be the typical form- all vary considerably- is very ~~rarely~~ nearly 1μ by 3.5 μ (.0000 343 in. by .000 1202 in.), made up of several not very evident articulations. They rest in some stages nearly or quite motionless, and in this condition show a curious peculiarity of lying in ranks ~~roots~~, side by side. In other periods of development they move ~~were~~ in an unsteady, undulating manner, with considerable rapidity; they turn and twist and tumble on their sides, on end, now drifting with the current, now swarming in an inextricable maze in the field of a first-class one-tenth objective.

"As the bacteria increase, the starch grains, stored by the tree for its own nourishment disappear, and I doubt not farther investigation will prove that, as in the blight of the pear and apple, butyric fermentation takes place. The diseased tree probably suffers in other ways from the presence of these minute parasites, but we may say with truth that it really starves to death. Its food gathered from the earth and air, assimilated by the leaves and stored for immediate or future use, is ruthlessly seized upon and destroyed. No doubt this takes place at all times of the year,

[This contradicts Pembleton's statement that starch is formed in excess in diseased trees.]

when the temperature of the surrounding air is considerably above the freezing point; but the bacteria are probably most active in the Summer time.

"Judging from my experiments upon the pear tree, the destroyers only gain entrance to the tissues of the tree through wounds in the epidermis or bark; but it is possible that at the time of flowering they penetrate by way of the stigma, which is not protected by an imperious coating.

"The cellulose tissue of the tree is not destroyed, and it is still a puzzle how the bacteria, minute as they are, pass from cell to cell. As in the pear, it is probably a very slow process, and is not connected with the circulation of fluids in the tissues."- Prof. T.J.Burrill in Science. Quoted in An. Rep. Sec'y. Mich. Hort. Soc. 1880. p 383.

An endeavor was made by Dr. R.C.Kedzie in 1880 to collect evidence as to whether premature peaches have caused sickness. But little attention was paid to the Circular then sent out. p. 179, An. Rep. Sec'y. Mich. St. Hort. Soc., 1880.

"He [T.T.Lyon, August, 1880] once received some trees from Georgia [from Mr. Berckman's] that showed yellows the first year in the stock, below the bud, showing the original tree to have been affected"- Ib., p. 273.

Mr. Lyon continued:- "He thought there was less yellows at the far South." p 273.

"He had heard that Wetsern N.Y. was free from yellows but last

winter he had letters from Hamilton, Ont., saying that peaches with yellows had been imported there from N.Y. and the disease was spreading. Last year [1879] he saw yellows near Rochester and saw that the commercial orchards there were being ruined by it. The claim that they don't have it there is false. In Delaware they consider that a peach tree has passed its point of profitable bearing when it is five years old, and they then root them out and plant anew (??!) * * * * * *

——"Young trees set last Spring may show yellows this season, it having been dormant in the nursery and developed by the shock of transplanting or it may remain dormant until brought out by the labor of fruitage. The diseased growths oftenest come from where otherwise there would be no buds" p. 274. * * * *

"Mr. Lyon had once obtained a lot of almonds from what he presumed to be a perfectly healthy tree but the young trees soon showed yellows, and on examination the old tree proved to be likewise diseased" p. 274. "When he finds yellows in young trees below the bud, he presumes the stock to have been diseased; if above the bud in the first year, he presumes the bud to have come from an infected tree" [What if both above and below?] *

"There was not much yellows there [So. Haven] until after the severe winter of 1874-75, when about 5% of the trees were found diseased and taken out. Afterwards until this year [1880] there was very little of the disease manifest. This year the disease shows an increase." p. 274.*

Yellows was severe at Lockport, N.Y. some years prior to 1884 in 20 acre orchard of good soil, belonging to J. S. Woodward. - C. & C. Gard., 1884, p. 28.

"Vineland [N.J.] this year had a fair crop of peaches, her first" *** "The growth of the trees is splendid [Oct. 19, 1868]" Corresp. in C. & C. G., 1868., p. 291.

P. J. Berckmans lived at Augusta, Ga. in 1884 & probably does now. Yes. 1940

Cf. Houghton Farm Experiments, No. 3 Series III. 1884.

In a letter to the C. & C. G. under date of Montreal, April 18, 1884 p. 376, 1884., Prof. D. P. Penhallows says: "In my first report for 1882 [Houghton Farm], I ignore contagion in this disease, and have still [1884] no reason for believing in it."

Peach yellows was in orchards at Falston, Harford Co., Md., in 1861-2, T.E.B. Country Gent., 1862., p. 270.

A correspondent of C. Gent., 1862., p. 235, from Cecilton, Cecil Co., Md. says: "The peach crop is fast becoming the moneyed one; hardly a farm is without its thousand or more trees. The Cassiday farm, now Reybold's *, has 400 acres in peaches. There are several other orchards nearly as large"

T.E.B. writing again in C. Gent., Sept., 1863, p. 209, from Harford Co., Md. (See above previous page.), says: "Peaches have generally failed in this neighborhood" Attributed it to yellows. "The yellows as it is called *** is contagious, and a single diseased tree will in a few years destroy an orchard. Every one that looks sickly, and especially one that ripens any of its fruit prematurely should immediately be dug up. The trees seem to thrive longest here on a pretty heavy clay soil." He says: "Rich ground and

* [This farm now, July 1888, is managed by Pro. P. R. Pal[illegible], Wilmington, Del. belongs to yellows was very prevalent on it in August 1888.]

high cultivation are fatal to peach trees," "because of yellows.

J.H.Sanborn in C. & C. Gent., 1867, p. 366, says peaches do well in Fla. and are not subject to yellows, borer, or curculio. Some owned by Geo. Stone, opposite Jacksonville, are "over 20 years old and I can see from my house over a dozen trees on Dr. Perley's place that are 24 years old, and bore from one to three bushels each, this past July [1867]".

"In five days- Sept. 12-17 [1869] 107,028 baskets of peaches were shipped from Benton Harbor, Mich., by propeller to Chicago and Milwaukee in addition to which large qu. were sent by schooners no acct. of which was kept." C. & C. G., 1869, p. 275.

"The peach trees cultivated in orchards here [central Del. 1873] usually live from 20 to 25 years and have been known to live 40 and even 50; while in N.J. where peaches are cultivated extensively for sale, orchards planted live only from 7 to 10 years." Alex. Pullen, chairman of Com. on Peaches, in Report before Cent. Del. Fr. Grower's Asso. Jan. meeting, 1873, p. 77. The Md. Farmer, 1873.

"That most insidious and fatal disease of the peach tree the yellows," p. 297 - The Farmer's Cabinet, Phila., 1838.

Lice were injurious to peach trees at Woodbury N.J. [near Philadelphia] in 1837. Ib., p. 54.

"The worm and the 'yellows' are two great contemporaneous evils which probably have no necessary connection with each other.-

The worm does not inquire whether the devoted tree is sick or in health;- the yellows is not always followed [another man thought borers followed disease] by its ravages. Let us therefore persevere in our investigation of these maladies, so distressing to the lovers of good fruit."-- Corresp. Sept. 1838. In The Farmer's Cabinet. p. 80, Phila. 1839.

"For many years [prior to 1847] the peach tree has been subject to a disease known as the yellows. This disease seldom makes its appearance before the tree has arrived at maturity, as its great vigor and rapid growth appear to preclude the development of the disease previous to the tree fruiting. Much time and labor and research have been spent in fruitless endeavors to eradicate the disease after it has made its appearance in orchards, and the only result arrived at is the necessity for re-planting new trees, to take the place of the old ones at short intervals of time. Many applications to trees have been recommended, and potash, lime, tobacco, banking up trees in Winter, etc. have had their advocates. Although individual cures may have been affected, or decay for a time have been arrested by the remedies, yet such instances are extremely rare; and when applied on a large scale are shown to be without value The disease, a true consumption, still continues and will continue, unless some radical method is adopted to eradicate it. From my own observation and experience I am led to the belief that this formidable disease has been much aggravated and spread throughout the country by budding from trees [illegible]

themselves the seeds of incipient consumption, not yet externally developed. A bud may be taken from a tree apparently sound but after a time both trees will be affected and decay.** That the disease however it may have originated has not its origin in either the soil or climate of this latitude is pretty evident. Natural trees can now be found in great numbers of many years growth along side fences and other neglected situations, perfectly sound, and likely to remain so." Farmer's and Mechanic's [where published?] quoted in Farmer's Cabinet. Jan., 1848, p. 182-3 Phila., Pa.

"All the young peach orchards in N.J. look as healthy as any of ours do, but when 3 or 4 years old they have the yellows. Nursery trees do not have, or at least, do not show the yellows; but generally after bearing their second crop of peaches the N.J. orchards all die. Still, in some parts even of N.J. they are exempt from the disease." — Mr. Barry, in discussion before Fruit Growers' Soc. of West. N.Y., p 89, Genessee Farmer, Rochester, March, 1861. At this time yellows had appeared in West. N.Y. Mr. Sharp "would warn people that many N.J. trees are being sold here, was fearful lest we become like N.J." Dr. Sylvester remembered that in 1836 there was not in N.J. 1/10# of the disease called yellows which there is at present." Ib., p. 89.

T. W. Harris' paper. Cf. preceding notes, occurs also on pp. 210 - 218 of Proc. Am. Pom. Soc. Boston Meeting, 1854. The part on yellows is on p. 212.

"The blight or the yellows in peaches is the most troublesome; excepting this the above named fruits are but little liable to disease [in neighborhood of Delaware city, 1856]. - Jno. C. Clark, quoted by L.P.Bush- chair. St. Fr. Com. for Del. of Am. Pom. Soc. p 99, Proceedings, 1856, Boston, 1857.

[formerly of Dover, Del.]

G. Emerson, M.D., of Phila. in a paper: "Agencies operating in the Atlantic States upon fruit culture, and more especially upon that of the peach" in Proc. Am. Pom. Soc., at Phila, 1869. Boston 1869; attributes yellows to a "loss of vitality in the tree, owing to exposure to lower degrees of temperature than its original organization enabled it to stand" He finds this theory of climatic agency is "strongly supported- if not demonstrated- by the fact that in the oldest parts of the U.S. the peach is now still found to thrive and bear luxuriant crops for 20, 30 and more years, in a section where the extreme cold of our winters is moderated through the influence of large bodies of water, as, for example in the peninsula lying between the Del. and Chesapeake Bays" [i.e. in the very region now worst infected!]

See p. 152, Proc. Am. Pom. Soc., 1875, for account of loss of peach orchard of 160 acres, about 1850-3, and of two others about 1871-73, in Baton Rouge Parish, La. The disease was probably yellows [Mrs. Stevens says she has seen the premature spotted peaches in La.] These trees are said to have looked well and grown finely "till about their 3d or 4th year," when they sickened and died. Report by R.H.Day, M.D., who owned one of the orchards.

Cf. consults Floy's ~~"Orchardest" or~~ "Guide to the Orchard". N.Y. 1833. being an Am. Ed. of Lindley. He gives symptoms of yellows.

[Secure 400 peach trees budded on plum stock in a region free from yellows. Transplant to infected orchards in Md. and Del. Plant side by side with these 200 unbudded plum trees of same age and from same locality,. Watch results for 4 years.] 1,000 were budded on Mariana stock in Aug. 1888. by J. W. Kerr, Dalton md. there are now (March 9 15) left in md & Del. in diff orchards.

Charles M. Hovey, never heard of Yellows in England or anywhere in Europe, for this reason he thinks the disease may be climatic. Trans. Mass. Hort. Society. 1882. Part I p. 131.

J. Croucher, recently from London, said that "the yellows is not known in England". Ib. p. 131.

"45 years ago [1837] it [yellows] was unknown here, [Boston] and when it came it swept everything"-- Jno. B. Moore- Tr. Mass. St. Hort. Soc., 1882., Part I, p. 140.

"The chairman said that yellows is not caused by exhaustion of potash, for it appears in new soils where there is no such deficiency"-- Ib., p. 141.

"The yellows is not much known in the two lower counties of Delaware [March 25, 1882], where the climate is warmer and not so variable as ours; but they have it in N.J. and Pa. " - C.M.Hovey, Ibid.p. 142.

Mr. Hovey also says- peach trees in houses, properly cared for never have it. Ib., p. 142.

[Amherst is in West. Mass. near the Conn. R.-east side of R.]

Col. F.D.Curtis, of Saratoga Co., N.Y. is quoted as saying that yellows is not common in East. ~~even~~ N.Y. Comm. of Growing Crops, Aug. 1887, U.S. Dep. Ag., p. 374.

J.S.Woodward, of Niagara Co., N.Y., says it has "nearly finished the orchards" [1887]. Ib., p. 374. He thinks it was introduced in Jersey trees.

Penhallow on peach growing in N.J. p. 27. Houghton Farm Report.

"Thirty or forty years ago [1842 - 52] peaches were grown in great abundance and perfection in this vicinity [Lincolm, N.E. Mass.] but for the last twenty years have been almost abandoned."- Samuel Hartwell,- Houghton Farm, Experiment Department. Diseases of Plants 1882. Series III, No. 2. Peach Yellows. By D.P.Penhallow, B.S., p. 27.

In 1882 Prof. Penhallow wrote, Ibid., p. 27: "In N.J. where the ravages of the disease have been more seriously felt than elsewhere, the southern counties were formerly the centre of the peach industry for the entire State, but owing to the prevalence of the yellows, the peach orchards have been gradually moving northward until at the present time, the counties of Morris and Hunterdom have the largest interests involved, and the prospect is that a few more years will see even these localities deprived of the in-

dustry."

"The peach growers of N.J. consider an orchard worth nothing after the age of 9 years. At that time they root out all the trees as they would so many corn stumps, and use the land for general crops, planting a young orchard of seedling each year to make good the loss."- Penhallow, Ibid., p. 28.

Yellows was present at Amherst, Mass, in 1878. Tr. Mass. Hort. Soc. Part I, p. 120. [and in 1890 !]

Peach Culture -- W. H. Ravenell,- In The Land We Love. Vol. 3, p. 257.

Peach Culture in Delaware - By Lodge. Harpers Mag. Vol. 41. p. 511.

"Very recent examinations of material sent from Michigan conclusively confirms my opinion that the yellows of the peach tree is caused by a similar organism. In the cells of an infected shoot I find very little stored starch, but numerous bacteria. These are seemingly different, under a one-tenth Tolles' or Spencer's objective, from the bacteria of the pear and apple. Compared with the latter they are long and slender, measuring about .001 mm. by .0035 mm. They consist of several joints, but little longer than wide in what appears to be the typical forms ." T.J. Burrill.-

"Bacteria as a Cause of Disease in Plants"- Am. Naturalist., 1881, p. 531.

The condition of peach growing in Middle and S. New Castle Co., and upper Kent, 27 years ago is very pleasantly set forth in a popular article by Wm. C. Lodge, Harpers Magazine, 1870, pp. 511-18, from which I quote the following paragraphs as a contrast to present conditions;-

"We leave the city of Wilmington,** and proceed directly to Delaware city, 20 miles south of the Pennsylvania line.

"Here we enter the peach region, and find a light, loomy soil, free from field stone and gravel.

"We first call at the mansion of the late Peach King, Major Philip Reybold.** From the observatory on the mansion we overlook the Delaware River and the bay for many miles; orchards of different fruits cover a large proportion of the surrounding country, and a vineyard, not far away, is loaded with purple clusters.

"Half a century since this whole neighborhood was an uninclosed wilderness, deemed unfit for agricultural purposes. The Major purchased a large tract, at a price almost nominal, gathered all the laboring force he could command, broke up the ground, fertilized it by a clover sward, and cultivated them for a couple of years, when they commenced bearing their great crops.

"The peaches were first sent to the Philadelphia market in sail boats, but all the small boats that could be procured were unequal to the transportation in the second year of bearing.

Steamers were chartered- others purchased; new and more distant markets were supplied, including New York, Albany, Boston, and the principal towns of N.E. and Canada.

"Yet thousands of baskets remained unpicked in the orchards. The ruling price for the best, in the Philadelphia market, was little over a quarter of a dollar the basket. They became a drug and at one time a cargo of 8000 baskets could not be sold at ten cents the basket. As a measure of relief the whole were thrown into the river.

"Proceeding to Middletown, we pass through a continuous orchard or a succession of orchards that seem to be one vast whole, the trees everywhere bending or broken with their loads of high-colored fruit. Middletown is on the Delaware Railroad and is the central station in New Castle Co. On the track there is a train of fifteen cars waiting for the days pickings. Each car carries about 500 baskets; and although early in the morning, the peach teams are already coming in from all directions. * * *

[I Determine, if possible, the peach acreage of New Castle Co. in 1870.]

"From Middletown to Townsend, where another peach train is waiting, the whole available country is planted with peach-trees. The ordinary farm crops appear to be neglected, while the labor is wholly devoted to gathering and marketing the fruit. In the alluvial table-lands of this neighborhood the peach tree finds all the elements for the produ ction of fruit. It is new soil, and

the trees are exempt from disease, and from such insects as render peach growing so precarious in other sections equally favored by climate.

"The orchardist is generally satisfied with a yield of three or four baskets of marketable fruit from each tree; but here the average is from seven to eight baskets from mature trees and many orchards give even more.

* * *

"The orchards increase in size as we proceed southward. Here [between Middletown and Townsend apparently] they are composed of from ten thousand to one hundred thousand trees each.

"By a slight detour [north] we strike the Delaware and Chesapeake Canal, the northern outlets for the products of the Eastern shore counties of Maryland, as well as for the farms along its course through Delaware. The plantations along the canal, and those extending several tiers back, are devoted to peaches. There is a landing on every farm, besides the public landings, where the roads cross the canal. The boats that carry the fruit are drawn by four horses or mules, and have capacities for from five to seven thousand baskets.

* * *

"About 25,000 baskets are daily carried by the canal boats in the flush of the season.

"All along the tow-path, in our drive of half a dozen miles, we notice that the landings are covered with peaches and the attendant teams, with the parties waiting to put the fruit on board.

This is the universal harvest, and brings money to the purse of every one willing to work, plenty to every home, and good cheer to every board. To the family of the planter it means many luxuries, in the shape of pianos, new carriages, fast horses, and perhaps an additional farm or two.

"Kenton in Kent Co. [S.W. of Clayton] is the next point of particular interest, as we are invited to inspect the fine orchard of Mr. Gercker in that vicinity. We drive through Smyrna, renowned for its peaches rather than its figs, * * *

"We pass orchard after orchard walled in by the impenetrable osage orange hedge that here grows luxuriantly. The country is ~~rarely~~ nearly level, and the roads so straight that we look before us away to where the lines of green converge to a point. * * *

"But here is Gercker's; and the first sight shows that it is a model peach farm. We take a birds'-eye view of the thousand acres, and note the order and neatness of the plantation, laid out in square fields of one hundred acres each. The buildings are located in the central part of the only field not planted with peach trees. A silver thread of water winds around the southern boundary, toward which the ground inclines. All other parts appear to be as level as a floor. * * *

"The trees are planted in parallel rows about 8 paces apart, and from our perch upon the top of a high gate-post we look down upon a section of the orchard in full bearing, extending from near the house to the distance of over a mile. * * *

* * *

"In the early morning we start for Dover, the State Capitol, and the centre of the finest peach district in the world. * *

"The rapid advance in the price of real estate has, within a few years, made many fortunes. Twenty years since the ruling price was from 5 to 10 dollars per acre in the forest, graded according to the value of the cord wood and timber. ** The land is generally now valued at one hundred times its original cost, and the profits of a well-managed peach orchard will pay the advanced price in a few years.

* * * *

"At Dover is a large distillery and three canning establishments, capable of preparing 25,000 cans of peaches a day. * *

"From Dover the railroad carries a daily average of ten thousand baskets, while three large steamers ply between its port at Mahon and New York City during the season, and are unequal to the freight. Today, hundreds of baskets are left on the wharf to perish, or to be sold to distillers at a very low price. Yet the loaded wagons still come to the landing, and a mile away we see clouds of dust indicating the speed by which the driver hopes to get on board his last load.

"The trees in this vicinity [Dover] are large and endure to a great age. An orchard outside the limits of the town planted upward of half a century since still bears fruit. We measured one patriarchal tree bending under its load of delicious Early Yorks that was forty-seven inches around the trunk, while its branches spread over a diameter of forty-two feet"- p. 5/8.

most of her farmers have market orchards."--No mention of yellows.--Account of visit to Mr. Tightman, Queen Anne Co., Md., The Am. Farmer, Balt., 1873. p.247-8.

of The Am. Farmer, Balt, 1872

On pp. 329-331, is an interesting account of a visit to "A Maryland peach orchard" in Sept., 1872. The orchard was that of the largest grower in the world--Col. Edward Wilkins, of Riverside, [Chester River], Kent Co., Md. At this time the home farm had about 25,000 bearing trees, an old orchard of like number having been dug up last winter. This orchard with the bearing ones on his outlying farms brought the total up to 120,000 trees. He also had 6,000 trees which had not fruited, and proposed to plant 25,000 more in spring of 1873.

On p. 330 the writer says: "Except the borer, the peach seems to have few enemies in Maryland. The 'yellows', the scourge of New Jersey, is, so far, almost unknown in Maryland."

? [Sep. 115]

From an editorial, "In the peach country", in the October number of The Am. Farmer, Balt., Md., 1874. p.331, I quote:

"With the ills enumerated [early frost, etc.], we have to chronicle another, [The writer spent a day in Sept., 1874 in and around Chestertown, Md.] which, though not a new one, is

INTENTIONAL SECOND EXPOSURE

one severely felt, and likely again to return to torment the growers of the peach. We refer to the Peach Aphis. We learned to our surprise * * that in some of the Kent orchards this minute but destructive pest was equally as numerous as it was lower down the peninsula. A notice of its ravages in Mr. Kerr's orchards and nurseries in Caroline Co. was given in our pages some months ago. In the orchard of Col. Wilkins --especially in the young orchards--this pest abounded in almost innumerable quantities. An orchard of 15,000 trees of the early Beatrice was conspicuous for the number of the Depredators.

"Numerous supposed remedies were early applied to destroying this enemy, but some time was lost in determining an effective application. * * It was only after considerable experiment that it was found that pure carbolic acid largely diluted in water was an instantaneous and sure cure." One part C.P. to forty gallons water. * * It was syringed on. "The solution was thus easily directed upon such parts of each tree as were most infected--the insects clustering generally on the extremities of the young branches. * * So acute an observer as Col. Wilkins does not hesitate to express his belief that the operations of the aphis this year [1874]

are but a prelude to the depredations to be expected from it hereafter. His theory is also that as a consequence upon their appearance in such swarms, the yellows will now be apt to penetrate into Maryland,--if not as a direct result of the injuries of the insect, at least on account of the impaired vitality of the trees, which will invite that disease or unfit them to resist its approaches. These insects during early spring may be discovered, in as great numbers as at any time on the leaves, on the young fibrous roots of the trees, and these roots are always found sapless and in process of decay." pp. 331-2.

Yellows at this time, 1874, may have been in Col. Wilkins orchards. Cf. Ibid. p.247, where it says that he found in his orchards varieties which should ripen some weeks apart, did ripen together; he also found "other unfavorable indications in his orchards."

Decay of peach trees attributed to the lack of tap root, i.e. to transplanting. Ibid. p.212, Rob. Chisholm. See also letter on same subject from Balt. Co., Md. in Letter File.

W.F.Goodwin, New Castle, Del., May 25,1874:--"We have the peach louse here and trees attacked are almost entirely stripped of foliage."--Ibid. p.213.

Ibid. p.213 is an account of a black "bug" which is ravaging the tops of J.W.Kerr's young peach trees. Mr. Kerr thinks the greater portion of his 83,000 young trees will be "entirely destroyed". It was probably aphis. Mr. Kerr afterwards told me that it was the black peach aphis. They swept his nursery clean that year.

Ibid. p.179. Sassafras Neck is said to be [1874] the great peach growing portion of Cecil Co., Md.

Consult files of Cecil Whig and Cecil Democrat, Cecil Co., Md., after 1874, for refe rence to yellows.

Middletown, Del., shipped by car peaches in:

1872, - - - - 450,000 baskets.

1873, - - - - 300,000 baskets.

W.F.Goodwin, Newcastle Co., Del., Ibid. p.179, says there were no peaches in the extreme upper part of peninsula in 1873.

March 4, 1874, Edward Wilkins, of Riverside, Md., writes on change in time of ripening of varieties of peaches so that they ripened at the same time. Says ~~also~~ he thinks a change

of quality has also taken place in some of our old and most esteemed varieties.

The editors say: "The subject is one coming home to every grower of peaches for market. The fact of the gradual lessening and final disappearance of the intervals between the ripening of kinds planted to succeed each other, is one which has become apparent to all cultivators, and the evil has been very seriously felt for years,--never perhaps having occasioned so much inconvenience and loss as in the year 1872. Then almost all differences of season appeared obliterated, and varieties whose period of ripening extended over at least three weeks time, seemed to come in together." [They had yellows and did not know it!] Ibid. pp. 123-5. Title: "Variation in the season of ripening of peaches, etc."

[J. S. Harris told me of Yellows in Kent Co. in 1869 or 70. See Note Book A in his orchards which were destroyed in part.]

The Wilmington (Del.), Commercial, 1875, is authority for the statement that the peach crop of 1875 was the largest ever known and nearly as large as all the crops together since 1870. "The total shipments were 8,782,716 baskets." The net returns are estimated at $1,618,944. or about 11¾ cts per basket. The Am. Farmer, Balt. 1875. p.429. It is not clear whether this applies to Delaware or the Peninsula.

A writer from the eastern shore of Maryland in Am. Farmer, Balt., Jan., 1875, pp. 25-6 scouts the idea that yellows is due to fungus on the roots. He propounds the conundrum: Why plums grafted on peach roots remain free from yellows when standing within a foot of peach trees which die of it.

He says peach aphis destroyed thousands of peach trees on the eastern shore of Maryland last year, 1874. Also states that they may be found "in dead of winter, congregated in campmeeting numbers upon the roots."

One writer has seen unmistakable yellows cured by cultivation. Ibid.

Compare Curtis on Aphides in Vol. 6, Tr. Lin. Soc.

Compare paper on aphis and yellows by Col. Wilkins. Ibid. pp. 100-102.

Cf. also Ibid. pp. 146, and 287, 306.

Prof. P.R. Uhler, of Baltimore, Pres. Md. Ac. of Sciences, pronounced the aphis--A. chrysanthemi, not A. Persicae. Says it was described from ox-eye daisy.

Compare Ibid. 1879, pp. 102, 358.

Ibid. 1880, p.55, where it says: The Every Evening, Wilmington, Del., sums up the peach crop for 1879 at 3,981,333 baskets at a net (for whole peninsula) of $1,500,000.

"At that time [1856] nearly the whole of the peach orchards of New Jersey had been destroyed by a disease known as the yellows, which disease is now generally believed by peach growers to have been caused by the Aphis, the trees being affected similarly [?] to the grape vine when infested by them. Fifty thousand acres planted in peach trees, in two counties only of that State had been destroyed by the yellows prior to 1850. This is fact, not fancy. Mr. Isaac Pullen, of Hightstown, N.J., who was an experienced nurseryman and fruit grower, than whom no man in the State was better qualified, by his intelligence and close observation, to speak ex cathedra on this matter, showed me in June, 1858, an orchard that had been planted four years, and was then on its last legs, with millions of Aphis upon the leaves, and billions more, of identically the same insect, upon the roots. Of

all the trees we pulled up for examination (and we pulled till tired), the small fibrous roots were dead and in a state of decay, whilst roots as large as my finger, over which the hordes of aphis had just passed to fresh fields of pasture, were entirely sapless. I was on a visit to Mr. Pullen to learn something of the yellows and to get his views of the cause, and was not surprised when he rose up from the examination of a tree, to hear him emphatically exclaim,—'This is the yellows, and this, the profane wretch that causes it.'" x x

"For the past twenty years, I have been largely engaged in growing fruit, my principal crop being peaches. My attention being called to the Aphis in 1858 by Mr. Pullen, I have made this insect a subject of careful observation, and will, in as few words as possible, state the manner and the results, with my conclusions.

"In 1856, I planted my first large orchard of peach trees --about two hundred acres--using trees of my own growing, except on about five acres at one corner of the field, on which I planted trees bought in New Jersey. The trees were all planted in good soil; were well attended to; grew so finely, and presented such a healthy, handsome appearance, that I did

not dream of disease, nor of Aphides on the roots, and did not look for them. In the month of May, 1860, four ~~weeks~~ years after planting, I first saw the Aphis on the leaf; I then looked for and found them in great numbers on the roots, but confined entirely to the New Jersey trees. This induced me to believe that the insect had been brought in from New Jersey, and that there was a periodicity in this mutation of the insect; and that like the Cicada and the apple and peach tree borers, the Aphis leaves its home in the ground for generations only. Subsequent observation has confirmed this belief, and formed the groundwork for the following conclusion: That the insect first gets into an uninfected district by flying, or is carried by the winds; or whilst in the larvae state by the natural drainage of the soil, or by importation in the plants from infected districts; that immediately after the larvae state the insect goes into the ground, not to hibernate, my dear Professor, but to find and to establish its home upon the rootlets of the trees, and there remain during nearly the whole of their natural lives, bringing forth their parthenogenetic young in vast numbers, and all alike to engage in the work of destruction by feeding on the sap of the small roots, thus literally taking the life-blood of the

tree, at the fountain head. They follow up the course of the root leaving death and decay behind them, until the period arives when generation becomes again necessary for the perpetuation of their species. The Aphis then comes out of the ground and lays ~~the~~ its eggs in the tender shoots and leaves, thus completing the cycle of their natural lives, leaving behind them a progeny so numerous that unless baffled by the skill of the scientist or husbandman, the cultivation of our choicest fruit must be abandoned [?]." * *

"Prof. Riley says the insect [the grape Phylloxera] thrives less, and is therefore less injurious, upon sandy soil. I have found the converse of this to be true [for the peach aphis], and have also found them more numerous upon clay soil well cultivated than upon the same soil half cultivated; and a still greater difference when the soil was covered with heavy sward; and have therefore concluded that in a friable soil, the insects movements are unimpeded, which could not be the case in heavy sward or compact clay." * *

"If Prof. Riley will come to Riverside, and it would give me great pleasure to have him do so, I will show him that our insect is no unimportant animal; and, though he is

disposed to treat him cavilierly, as not entitled to the respect of his high-named brother Phylloxera, yet the Aphis Persicae, as he calls him, because he happens to dwell among peach trees, is no insignificant enemy to be disposed of by the Lady Bird; nor are our orchard interests so trifling, as to be committed to such insufficient protection. Ithink all the Lady Birds in the State of Missouri could have grown fat from the Aphis on a single row of trees in some of our orchards last season [1874]. [Yellows was undoubtedly in his orchards at this time.] If the Professor will come, I will take him into Mr. Kerr's nurseries, [Caroline A.] and let him see that the insects were not conquered by their enemies; and did not cease their injuries in June or July, as he thought they would, but that they are now [Feb. 2, 1875] on the roots, out of reach of their natural enemies, doing ten times more damage than they did when on the leaves last summer. He can also see here [near Chestertown] in numerous orchards, large colonies now on the roots, including the mothers of many generations, the half-grown, and the infants just brought to life, all engaged in the work of destruction." * *

"In New Jersey, the peach belongs to the past [1875]! The same may be said of the upper part of the State of Delaware, ~~and if this insect is to be left to its natural enemies it will not be long before our entire the finest fruit growing region in the world, will be brought to~~

and if this insect is to be left to its natural enemies, it will not be long before our entire [peninsula?], the finest peach-growing region in the world, will be brought to the same deplorable condition. * * --Edward Wilkins, Riverside, Md., Feb. 2, 1875. pp. 100-102. The American Farmer, Baltimore, Md. 187[illegible]. Title, "The Grape Phylloxera and the Yellows in Peach Trees."

In reply to this (Ibid. p. 146) Prof. Rilay says: "If Mr. Wilkins has traced any real connection between the yellows and some root louse on the peach--which from what I know of the yellows I can scarcely believe--he has made a grand discovery." Specimens of this Aphis were not sent to Prof. Riley but to Prof. Uhler of Baltimore, who says: "So far as the insect can be determined, when in its wingless state, it is the Aphis chrysanthemi, of Koch, found originally living on the ox-eye daisy, and not the Aphis Persicae."

"We spent a day last month [July, 1875] in company with Prof. P. R. Uhler and Mr. Breckenridge at Riverside, the well known farm of Col. Edward Wilkins. * * Prof. U. is the President of the Maryland Academy of Sciences. * * Col.

Wilkins was desirous that he should have an opportunity of seeing, on the ground where it is playing such havock, the Aphis which infests the peach crop and threatens to materially lessen if not entirely destroy the product of that fruit in the section which seems by nature especially adapted to its growth. An examination showed that these minute insects were numerous [July] as well on the leaves as on the roots, and Prof. Uhler was fully satisfied, we believe, that they are identical, and that they are the Aphis chrysanthemi [Koch] and not the Aphis Persicae, as often assumed. Col. Wilkins says they are this year far less numerous and destructive than last season and this fact confirms his belief in the periodicity of their appearance on the leaves.

"In an orchard of 15,000 trees, originally planted with Rivers' Early Beatrice, the destruction by this pest has been so great, that there have been successive plantings to the number of 20,000 trees, so that of the original trees probably not three hundred remain. A number were dug up and it was found that last year's roots had in almost every case been denuded by the aphis of their fibrous feeders, but that in many instances the trees had asserted themselves and put forth fresh rootlets, which enabled them to maintain a bare existence."--Ed. of The Am. Farmer, 1875, pp.278-79.

"YELLOWS IN THE PEACH OR FACTS VERSUS FUNGUS." By J.W. Kerr, Denton, Md., Feb. 12, 1879. Mr. Kerr states his belief that fungus has nothing to do with yellows, but that it [the fungus] is due to ~~the~~ Aphides. He says: "On an examination of trees from two to five years old, which had been killed by the Aphis, I found the roots to be visibly marked and nettled over by a mildew or fungus; again, trees upon which the insects were preying upon in countless hundreds, and which were so reduced in vitality, by the ravages of the insect named, as to barely afford sustenance for them, these trees when dug out were found to have the mildew marking their roots, though less plainly visable." He also found the mildew on roots, injured by frost before planting two years previous. He thinks the fungus follows the weakened vitality. Ibid. 1879, p.102.

[Mr. Kerr had seen yellows in Pa. but in a letter to me in 1888 says it has never appeared in Caroline Co., Md.]

I saw ~~of them~~ later. E.A.S.

The peach crop of Maryland in 1879, on page 358, October number of The Am. Farmer, Baltimore, 1879, is estimated at 1,490,000 boxes. The market was overstocked and thousands of boxes sold at six and twelve cents. "The average price during the season has not been fifty cents."

"There is little doubt in my mind that the temperature of

the earth, and atmosphere is too low for the most successful peach culture in those sections where the yellows is most complained of [i.e. in the places where the peach ~~it~~ has hitherto ~~therein~~ flourished most certainly!] Jas. MacPherson. p.641. The Cultivator and Country Gentleman. 1885.

The Del. Tribune estimates the peach crop of that State in 1873 at 3,491,050 baskets. Av. Value 40 Cts. p.105. Cultivator and Country Gentleman. 1873.

"The Yellows in the Peach." By C.H.Peck, New York State Museum of Natural History. pp. 694-95. Ibid. 1879. His specimens and field notes were from Mrs. L.A.Millington, of Michigan, "during past two years." I quote:

"Very warm, dry weather has seemed to favor its rapid development." p.695.

Oidium fructigenum was found by him on one peach. Mrs. M. says it rots the fruit and if this is not removed poisons the twig that bears it so it dies." p.695. Peck says it also occurs on plums and pears.

His conclusion is "I do not think the disease [yellows] is produced by any ordinary parasitic fungus."

Peaches in Delaware in 1879. Great shipments around Lebanon, Del.,—54,000 baskets five-eights bushel were shipped in three days, requiring 103 cars. Mr. Hanson received over $3,000 at sixty cents per basket for one weeks' delivery to a cannery,--week ending Aug.23. He will have from fifteen to twenty thousand baskets from less than ninety acres. Ibid. p.569.

"It [budding peaches on plum stocks] is no protection against yellows." Ed. C.&C.Gent. 1879. p.136.

Plum is reported to do well on peach stock in California, in South Pennsylvania, and the Middle States farther south, but with the exception of a few sorts it fails at the north. C. & C. Gent. 1878. p.694.

[The importance of having a regular succession of peaches is very great. Yellows prevents this.]

"We have here [Centralia, Ill., 1870] a stretch of country, say eighty miles in extent east and west and thirty or

forty miles north and south, in which peaches are abundant and of excellent quality." One man had as high as 10,000 boxes; several, 5,000. C.& C. Gent. Sept. 1870. p.550.

Dr. Hull, of Alton, Ill., in Prairie Farmer gives the result of his experiments in root pruning of the peach. "To abridge labor he performed the work with the plow." It was done in October. He plowed one way deep several times to within four feet of the trees. A coulter being used to cut off as many roots as practicable. Late the following spring the plow was run at right angles in the same ~~way~~ manner. The whole labor--1800 trees--was done by one man and team in five days.

Results: "The maturity of the crop was so much hastened that shipments of Hale's Early peach were made on the first of July, and daily for twelve days afterwards, when the crop from unpruned trees began to ripen. The difference was about two weeks in favor of the root-pruned trees. Both were treated precisely alike in every other respect. The fruit of the root-pruned trees was much the larger--averaging from one-third to double the size. By way of comparison, two peach trees had the branches girdled when the peaches were

about as large as hazelnuts. Those ripened their fruit as early as the root-pruned trees, but the flavor, as usually happens in such cases, was poor, and the peaches insipid. But the fruit on the root-pruned tres was highly colored and of excellent quality." Cultivator and Country Gentleman, 1871. p. 678.

[Does yellows girdle the branches in ~~thes~~ some way?]

Plums on peach stock are said to be a failure. Ibid. 1872. p.440, editor, and 582, correspondent.

Delaware Peach Statistics, 1872. By J.A.Fulton. He says: "The peach trade has grown up mainly since 1840. 40,000 acres are now planted with something over 5,000,000 trees. The average value of these orchards is put at $50. per acre, or a total of $2,750,000, and the working capital for handling, packing, fraight, commissions, etc. at $3,170,-000 more, a total of $5,920,000." From an address before the Fruit Growers of Delaware. Cultivator and Country Gentleman. 1872. p.390.

The peach shipments through Wilmington, Del., in 1872, up to Aug. 20 were 1,402 car-loads. "It is thought that the bulk of the crop is now marketed." C. & C. Gent. 1872.p.553.

"According to the assessors' returns, the number of bushels of peaches produced [in Ohio] the past six or seven years has been as follows:

1869 - - - -	1,444,523.
1870 - - - - -	309,639.
1871 - - - - -	866,536.
1872 - - - - -	405,619.
1873 - - - - -	94,516.
1874 - - - - -	2,335,514."

[These returns are not very accurate.]

M. B. Bateham, Painesville, O., (Secy. Ohio Horticultural Society.) Cultivator and Country Gentleman. 1876. p.182.

"Caspar Hiller said [1875] that the yellows was much less prevalent [in Pennsylvania] than formerly." Rep. Penn. Fruit Growers Association. C. & C. Gent. 1876. p.310.

Cold winters not a cause of yellows. C. & C. Gent. 1876 p.134.

In 1877 the S. Cultivator gave some curious facts showing wide variations in ripening of peaches in S.C.--attributed to locality and external influences. C. & C. Gent. 1877. p. 413.

"The largest [peach tree] we have seen noticed is one in Southern New Jersey mentioned in the agricultural report of Cumberland Co. [!] It has a trunk eight feet in circumference, two feet above the ground, or thirty inches in diameter. It is stated that there has been sold from this tree $38. worth of fruit in one year."--Age is not stated. C. & C. Gent. 1886. Aug. p.588. The Editor says: "We have seen trees in old Indian orchards in Western New York which measured a foot in diameter."

Plums on peach stock seem to have done well for Josiah Hoopes, West Chester, Pa. C.& C.Gent. 1886. p.148.

According to the Pacific Rural Press the estimated number of peach trees in California is 1,200,000; apricots, 500,000.

[Use the profit in Maryland and Delaware as an argument that peaches are suited to that region.]

[What data as to peaches suffering from yellows when on plum stocks? Bud some hundred; set in a badly infected region; and watch results. Plums on their own roots must be set for comparison.]

"According to the Peninsular News, there were shipped from Delaware during the peach season [1877], 3,666,500 baskets, yielding a net return to the growers of $1,099,950. In addition to this there were dried and canned about 300,000 baskets more, which will yield the growers $120,000 more, making the total value of the 1877 Delaware peach crop $1,219,-950." C. & C. Gent. 1877. p.651.

"Last summer in reporting the success of the peach culture in the Niagara river near the falls we mentioned the orchard of Mr. Burdett, which had borne fruit for more than twenty years, consisting of two thousand trees, and yielding in a favorable season over $6,000." The orchard is on the river. Ibid. p.554.

In 1877 Clermont and Warren were the great peach counties of Ohio. Ibid.p.424. [East & N.E. of Cincinatti - Clermont is on Ohio River]

"We have lost most of our trees in this region [Benton Harbor, Mich., 1877] by yellows." Correspondent in C. & C. Gent. 1877. p.72.

"This violent and contagious disease has nearly destroyed

the peach orchards at St.Joseph [Mich.]."--T. T. lyon, 1877, quoted in C. & C. Gent. 1877. p. 765. At this time it was already at South Haven. Another St. Joseph correspondent says the people knew or were told what the disease was from the start, but refused to believe and "stopped to doctor." p. 810.

"The Wilmington Commercial gives the following statement of peaches shipped from Delaware in 1874: By rail 627,669 baskets; by water to Baltimore, 54,550; by water to Philadelphia, 155,000; aggregate shipment by water and rail 837,219 baskets. It is thought that the average price per basket received from the crop was about 80 cts." C. & C. Gent. 1875. p. 24.

A Delaware correspondent of the New York Tribune gives an itemized account of the Delaware peach crop for 1875 and sums up the total yield at 8,782,716 baskets; the net profit at $1,018,000 "or a trifle over 11½ cts. per basket." C. & C. Gent. 1875. p. 745.

A correspondent of the Cultivator and Country Gentleman,

Jan. 1869, p.79, from McDonough [New Castle Co.] Del., says Mr.E.Fennimore who has a landing on Delaware river has a peach orchard which "has not failed once since it came into bearing seven years ago with 10,000 trees (it now numbers 9,000). His gross receipts have been $120,000 for 114,000 baskets, in seven years." The orchards around did never ~~do~~ as well.

A good many peaches appear to be grown about Union Springs N.Y.--C. & G. Gent. 1874. p.121.

Peaches in Niagara Co., New York.

"The growing of the peach for market is fast becoming a very important branch of industry in this county. This is probably one of the most favorable portions of the country for growing this fruit successfully. With ordinary care and culture, the peach tree here grows to perfection. Until within a very few years, comparatively few have been engaged in this business. Those few have made money. But the rest of the famers are beginning to find out that raising peaches pays, and the rate at which orchards have been and are being set out is wonderful. I think that fully one-half of the

peach orchards in this county have been set within the last three years. Those who, a few years since thought four or five trees a plenty, are now setting at the rate of 1,000 to 2,000 trees in a single spring. Peaches are nearly a sure crop here every year. The crop of the past season [1874] was unusually large. * * As nearly as can be ascertained there were fully 100,000 crates [three-fourths bushel each] shipped from this county. * * * The average price received by farmers was about one dollar per crate." P. G. P. in C. & C. G. 1874. p.820.

A Delaware correspodent of the C. & C. Gent. March, 1867, p. 209 dwells on the great increase in the value of land around Odessa, McDonough and Middletown, Del., owing to peach growing. He says 2,800 acres three miles from Odessa [east ppvbbly] was offered for $2,600, thrity-five years ago [1832]. "It is now divided into one-half dozen farms, one of which, owned by Mr. Fennimore, cleared on peaches in 1855? [1865?] $30,000, and in 1856? [1866?] $28,000. A farm of 151 acres , two miles from Odessa in the same direction sold a few weeks ago [i.e. early in 1867] for $30,000, and the purchaser was offered an advance of $2,000. a few days after. The farm of G.W.

Karsner, near McDonough, 300 acres, was bought for $14. per acre thirty-five years ago; it is now [1857] assessed at $150.00, and valued by some as high as $250. per acre. Another farm, of 170 acres, of poor land, also near McDonough, without fences sold at public sale in October [1866] for $120 per acre. A gentleman near Middletown who was willing to sell his orchard last spring for $1,500 was afterwards offered $5,000 and refused it, and his last peach crop sold for two dollars a basket, and cleared him $9,000."

The net profits on Reybolds' Delaware peach orchards for the three years 1861-2-3 is stated to have been $300,000--about 650 acres (?). He is said to have put out 150 acres last fall [1863] and to be intending to set 200 more this fall. C. & C. Gent. 1864. p.81. [Ask Dr. Dunlop about this]

"G. Ellwanger said the peach was largely propagated in England on the plum, and the trees were successful, and continued growing for a long time." Most members thought peach on plum was short-lived. Notes on Meeting of Fruit Growers Society of West New York. Jan.27, 1864. C. & C. Gent.1864. p.78.

Compare Transactions of West Jersey Fruit Growers Association. 1864 and later years. (pamphlet.) This report says "Twenty-five or thirty years ago peaches were grown in this locality [ ] The report is apparently for four townships ← Burlington twp. etc.--Moorestown, Cinnaminson, etc.] with but little care or cost, but a change came over them, and for many years scarcely any could be produced. Many trees that were planted out died without bearing any fruit; indeed it was thought to be an entire waste of labor to plant peach trees. But there seems resaon to believe that they are again becoming a surer crop, and many are planting new orchards [1864]." Wm. Parry was Secy. of the Association. C. & C. Gent. 1865. p.305.

Henry T. Williams, office New York Independent, in C. & C. Gent. July, 1868, p.14, is authority for the following statements relative to profits of peach growing in Delaware:--

The peach shipments from Delaware in 1867 were:

By Railroad, - - -	1,108,000 baskets.
By water, - - - -	750,000 baskets.
Total, - - - -	1,858,000 baskets.

"James Pennimore, of New Castle Co., sold from an orchard of 100 acres (10,000 trees) in four consecutive years $87,000 worth of peaches. * * Another case is true where an orchard of less than 2,000 trees yielded in one season $4,000 net profit.

"Another near Dover, which I myself saw in crop time, yields from seventy acres a profit of $10,000 yearly [?], the purchaser buying the crops on the trees.

"There are other instances where a place of forty acres yields $2,000 per year; one of three and one-half acres yields $500. per year [They would not do so every year]; one of five acres $1,300; one of twenty acres yielding fruit to the amount of $4,300 annually; and one of five acres where the income from peaches is greater than from the rest of the entire farm of 350 acres.

"At Milford between $8,000 and $9,000 have been cleared in three seasons from 2,500 trees.

"Orchards in the two lower counties range from 5,000 to 20,000 trees, and one gentleman in Sussex put out 60,000 last season [1867]."

Rutter on the Peach. 1880, says Somerset Co., Md., was and is entirely free from "yellows" of the peach.

Under date of May 25, 1887, in a latter to the Department, Henry J. Nettleton, of Durham, Comn., says his peach trees have been troubled by yellows and are short-lived, especially if they grow thriftily and rapidly.

"All attempts to raise peach trees have proved unavailing for the last eight of ten years, in consequence of the 'yellows'."--A. Hoover, Centreville, Wayne Co., Ind., Dec.24, 1850, p.375. Patent Office Report (Agric). 1850.

Notes from "History of Michigan Horticulture." By T.T.Lyon 1887, State Printer's. ~~The Index pp 206-228.~~ Reprint from Mich. State Hort. Report, 1887. Yellows Law, 23.

Geo. Parmelee, Benton Harbor, planted two and a half acres of peach trees in the spring of 1848. "This beginning he followed up as rapidly as possible till he had ninety-eight acres under orchard, mostly peaches." In 1850 he planted the first Crawfords. p.23. See p. ~~213~~, notes.

"The first considerable impetus to peach planting occurred upon his contracting his first considerable peach crop for $1,500, delivered at St. Joseph." p.24.

Mr. Lyon speaks here of extravagant inflation of lands values in Berrien Co. for a time. p.24.

At the June meeting of the State Pomological Society at Benton Harbor, 1872, "Reports were made as to the price of fruit lands. At Fruitport $50 to $100 per acre. At Benton Harbor improved lands carrying bearing orchards, $1,000 per acre." p.33.

A peach tree thirty-seven years old was cut down prior to 1872 in Berrien Co. p.33.

The winter of 1872-3 was of exceptional severity. p.37. The peaches which escaped were near the lake or on high unprotected places. p.41.

In 1873 at South Haven, improved lands, bearing orchards sold for $300. Lands unimproved within one and a half miles of the village, $25. p.43.

"When about the end of the last half century [1850] Eleazur Morton, George Parmelee and Curtis Boughton, the pioneers of St. Joseph peach culture, set their respective orchards--an aggregate area of about twenty-five acres--people opened their eyes in amazement at this exhibition of lunacy, thinking the product of such large orchards would overstock the market. Now, [1874], with their estimated 600,000 peach trees in that region in 1872, besides extensive orchard interests at South Haven, Saugatuck, Holland, Grand Haven, Spring Lake, and other points north along the shore, our Western Michigan fruit growers are relieved of the charge of lunacy." A. S. Dyckman, South Haven, 1874. p.48.

Peach trees grew at Travers City in 1875. p.54.

Ann Arbor was known to be a good peach region as early as 1878. p.81. [Interview J. D. Baldwin or J. Austin Scott on early peach planting in vicinity of Ann Arbor.]

"Yellows is gradually working northward. A few 'sporadic cases' are reported as far north as Ottawa and Kent Co's. [1882]." p.128. Quoted from replies by correspondents in 1882 to postals asking fruit prospects sent out by Secy. St. Hort. Society.

Best method of destroying the green aphis on the peach. A paper. On page 153.

[Insect must be in Michigan.]

State Census of 1884.

Peach orchards of Michigan, 24,502 acres; 1,428,209 bearing trees. p. 186. Tobb VII Mp 218, 219 Vol. II. Michigan Census, 1884.

Yellows law. p.189. checked 88 from census April 17, 1888.

Census notes, 1884. Michigan, L. P.

County.	No. peach orchard. acres	page
Monroe	139	217
Lenawee	369	226
Hillsdale	259	229
Branch	90	230
St. Joseph	66	232
Cass	223	235
Berrien	503	246
WAYNE	~~837~~ 78	258
Jackson	195	261
Calhoun	255	263
Kalamazoo	283	267

Van Buren	2,181	275
Macomb	473	278
OAKLAND	1,693	282
Livingstene	279	
Ingham	80	286
Eaton	175	289
Barry	389	291
Allegan	8,367	300
St. Clair	321	300
Lapeer	140	303
Genessee	141	303
Shiawassee	146	306
Clinton	183	308
IONIA	586	312
Kent	3,362	326
Ottawa	984	336
Sanilac	22	336
Tuscola	157	338
Saginaw	10	342
Gratiot	24	343
Montcalm	35	345
Muskegon	463	
Huron	23	348

Bay	8		350
Midland	0	4 bearing trees	350
Isabella	4		352
Mecosta	19		352
Newaygo	62		353
OCEANA	864		355
Gladwin	0	1 bearing tree	356-7
Clare	0	4 bearing trees	
Osceola	71		358
Lake	3		359
MASON	306		360
Iosco	13		361
Ogemaw	8		362
Roscommon	0		363
Missaukee	5		363
Wexford	95		364
Manistee	27		367
Alcona	0		
Oscoda	0		
Crawford	0	6 trees	
Kalkaska	6		373
Grand Traverse	124		380

Benzie	123	383
Alpena	0	
Montmorency	0	
Otsego	0	
Antrim	49	
Leelanaw	60	391
Presque Isle	1	
Cheboygan	0	
Charlevoix	3	
Emmet	9	
Manitou	6	

The great peach counties of Michigan in order of time are Berrien, Van Buren, Allegan, Ottawa and Kent.

Lesser counties: ~~Kent~~ Oakland, Ionia, Muskegon, Oceana, Mason. No reference to time.

[1848 appears to be the starting point of extensive peach growing in Berrien Co.]

BERRIEN COUNTY.

About 1775 Mr. Burnett established a trading house near the mouth of the St. Joseph river--D.A.Winslow. History of St. Joseph. 1869. "In the orchard set out by Mr. Burnett, he set several peach trees, and they were still there in 1829 and for several years subsequent; but being on interval land they were subsequently killed, in a season of extraordinary high water. There is now (1869) a peach tree in the old orchard just south of Hickory creek on the Niles road, that is over thirty years old; and last year it bore a fair crop of fruit; yet the tree has had no special care for many years. There were peach tres scattered through the country prior to the year 1848 but they were all seedlings. Prior to this date it is not known that there was a budded tree in the county." Winslow. p.47. Lyon. p.236.

? [see p. 146]

"B. C. Hoyt, Esq., banker, of St. Joseph, one of the oldest inhabitants, coming here ih 1829, states that he found a seedling peach planted by old William Burnett who had been dead over twenty years. That tree lived and bore fruit for ten or more years thereafter. The first peaches ever sent to the Chicago market came from Mr. Hoyt's garden in 1839. * * They were seedlings."— L.J.Merchant., Lyon p.237.

Simeon Wilson, another pioneer, says the Burnett orchard had seedling peaches when he settled there in 1831. Most of the settlers had a few seedling peach trees. Do. p.237.

"Before peaches were sold in Chicago from this region, even before St. Joseph could supply itself with fruit, Mr. Brodiss, who lived six miles this side of Niles, brought his seedling peaches by the canoe load, down the St. Joseph river to peddle in St. Joseph. This was in 1834." Fruit was brought to St. Joseph from the Abbe orchard in 1837, said to have been set with improved trees sent from Rochester. Do. p. 237.

Capt. Curtiss Boughton "bought peaches by the barrel and dry-goods box, in 1840, carried them on his vessel and sold them in Chicago making enormous sums of money. * * This gave the whole country the peach fever." Do. p.237.

"Mr. Hoyt [of St. Joseph] states that in 1842, he procured from Long Island buds of improved varieties to start a nursery. No improved fruit went to Chicago till after 1844, when he sent over a few baskets of Crawfords. * * After

1845 the shipment of choice fruit began to increase, beginning with a few hundred baskets (three pecks) and reaching several thousand in 1855, when a great many Crawfords were shipped." Do. p. 237.

Hon. H. C. Morton, of Benton Harbor, says: "The first peaches were seedlings. Crawfords were first introduced by B.C.Hoyt, Esq, who obtained buds from Prince of Long Island." Do. p.238.

"Mr. George Parmelee * * put out his first trees in 1848, in the town of Benton, north of Paw Paw R., setting two acres of budded trees. He ~~con~~sub-sequently enlarged his orchard until it covered about ninety acres. Samuel Johnson now owns the pioneer orchard of Mr. Parmelee [January, 1873], in which are some of the largest and finest peach trees in the county." [Twenty-five years old.] Do. p.238.

"In 1849 Captain Boughton set out 130 budded peach trees in St. Joseph township, south of St. Joseph river. In 1850 he shipped 250 barrels of seedlings, and 150 barrels of improved varieties, twice a week. The shipments for the year

were, by his vessel alone, not less than 10,000 baskets." Do. p.238.

The "Cincinnati" peach orchard containing sixty-five acres was set out in 1857. Do. p.238.

"From this time [1857] the fruit interest commenced to grow rapidly, as one after another settled here and went into the business; and in 1865, a canvass was made which showed the names of about 250 persons engaged in fruit raising. Now, in 1872, our canvass shows over 800." Do. p.238.

"Only a few years ago, this section of country was generally covered with heavy timber; now [Jan. 1873] it is an almost unbroken mass of fruit trees and vines. Then there were only a few roughly constructed houses, where dwelt the hardy pioneers; now the country is thickly dotted with handsome residences, the abodes of wealthy fruit growers, and millions of dollars are invested in the business of fruit culture." Do. p.238. J. Gaughran, of Ann Arbor, who formerly lived in that region, told me the whole country was covered with orchards at that time. Mr. G. is a nurseryman & fruit grower. Conversation on March 3, 1888.

S. F. Heath, of Heath's Corners, about 1865 or 1866 purchased five acres of bearing peach orchard for $1,300. His first crop sold for $1,800. He then sold the five acres to Wm. Gates for $7,000. Mr. Gates sold his first crop for $2,000, and his next one [1868] for $4,000. It is said that he had "good prospects for a greater crop ~~in~~ the following year." D. A. Winslow. History of St. Joseph. Lyon. p.239.

"Mr. Carley, four years ago [1865?], purchased forty acres of peach orchard for $5,000; paid $1,500 down. The first year after his purchase he cleared from his peaches $2,800. ~~He~~ He has since paid for his place, has money left, and is now independent, all of which, except the $1,500, he has made from his peaches." D. A. Winslow. Ibid. p.239.

In 1868 (?) in a letter to D. A. Winslow George Parmelee states that in 1865 on his farm in Berrien Co. "forty-one Early Crawford trees produced a few baskets over 1,100, and sold for two dollars per basket, amounting to $2,200. The trees were twenty feet apart each way, which puts 109 trees on an acre, and makes the yield at the rate of $5,848 to the acre. This, of course is given as an extreme result, but if any man

thinks that peach growing in this region is not profitable, let him call on our fruit growers and get facts."

[This is at the rate of $53.66 per tree.]

Peach trees in fruit region of Berrien Co. pp. 240-41.

1865	- - - -	201,603.
1869	- - - -	365,530?
1872	- - - -	594,467
1874 (Census whole Co.)		
1884	- - - -	54,827 (Approximate,— 109 trees to acre; over one-half being trees recently set.

In December John Whittlesey, of St. Joseph, reports the following peach shipments for Berrien County in 1877:

By water - - - 422,225 baskets;

Ryder, Prof. of Zoology in Univ. of Pa. told Mr. Swingle in fall of 1893 that he had seen Peach Yellows in a Locust tree growing near a diseased peach.

I have seen witch brooms on the common locust. Cause unknown. Such sprouts die early have low vitality many times branches young small leaves.

thinks that peach growing in this region is not profitable, let him call on our fruit growers and get facts."

[This is at the rate of $53.66 per tree.]

Peach trees in fruit region of Berrien Co. pp. 240-41.

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1872	- - - -	594,467
1874 (Census whole Co.)		
1884	- - - -	54,827 (Approximate, 109 trees to acre; over one-half being trees recently set.

In December John Whittlesey, of St. Joseph, reports the following peach shipments for Berrien County in 1877:

By water	- - - 422,225 baskets;
By rail road	- - - 65,333 including pears and grapes. Ibid. p.241.

"About the year 1862* the disease known as yellows was introduced among the peach orchards of the county [Berrien]." Lyon. p. 242.

* Wrong date. See statement by Mr. Brown the author who says it should be 1866.

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VAN BUREN COUNTY.

In Van Buren county, Dolphin Morris planted peach pits as early as 1830 and trees grew therefrom which lived many years. . . p. 268. See next statement.

"In 1836 Isaac Barnum brought with him from Cayuga Co., N. Y., peach pits from which sprang the first peach trees grown in the county. These were all chance seedlings, some of them of fine quality; one of them, Snow's Orange, has become a popular variety." Ibid. p.269.

In 1850 and several successive years, C. Engle of Paw Paw observed that a few peach trees on high land blossomed freely when others failed. In 1861 he planted seven hundred trees--Early Crawford and Snow's Orange--on a ridge of his own farm. In 1866 he sold his first crop for $2,100. One hundred in a low spot winter killed before this crop. The rest yielded $3,300 in the next sixteen years,--1866-82. Ibid. p.269.

In 1860 N. H. Bitly planted 500 peach trees on the hills near Lawton. These bore their first crop in 1866. "During the next two years--1867 and 1868--several orchards were

planted, and this continued until about 150,000 trees were in orchards in the vicinity, when yellows made its appearance among them [about 1878], and this and the cold winters put a stop to planting." Ibid. p.269.

"The largest peach crop ever produced in the vicinity of Lawton was that of 1880, although that of 1881 was a good one. * * * In 1880 one person cleared $2,500 from ten acres of five-year old peach trees." Ibid. p.270.

"During or soon after the year 1852, S. B. Morehouse and Randolph Densmore planted [peach] orchards north of the river [at South Haven]. * * Within the next few years Mr. James L. Reed planted an orchard * * south of the village. This orchard has within the past eight or ten years [prior to 1887] fallen a prey to the yellows." Ibid. p.271.

"A peach tree nursery was planted at South Haven in 1857." Aaron Eames planted from this nursery four acres in 1859. Ibid. p.271.

Soon after 1861 John Williams planted a peach orchard at South Haven. Ibid. p.271.

"In 1870, the planting of orchards [at South Haven], especially of peaches, pears and grapes, increased with far greater rapidity. Doubtless this tendency was increased, rather than otherwise, by the failure of the peach plantations of Western Berrien, upon the advent of the yellows with the utter neglect to apply any effective remedy; while the orchardists of Western Van Buren, forewarned by this experience, by a general extirpation of diseased trees, were enabled to so far hold the disease in subjection that it proved a comparitively slight restraint upon the planters. Its first appearance here was in 1873 although it seems to have followed the railway northward and appeared in the central part of the county at a somewhat earlier date [why follow the railroad?]." In nursery stock(?) Ibid. p.272.

No process has ever been issued for the enforcement of the yellows law at South Haven. Ibid. p.272.

"The disease made its appearance in the orchards about Lawton during the summer of 1878." Ibid. p.272.

In 1864, A.S.Dyckman, of South Haven, shipped 600 baskets;

in 1872, 12,000. In 1880 he had fifty acres--8,000 trees. In 1886, eighty acres. The net returns from these plantations are reported to vary from $2,000 to $10,000 per annum. Ibid. p. 273.

"The orchard committee of the State Pomological Society in 1877 found several peach trees in the orchards of A. S. Dyckman, at South Haven, which had been planted seventeen years since, and which measured thirty-nine inches around the trunk, with a spread of branches of thirty feet." Ibid. p.274

ALLEGAN COUNTY.

Central part of county. Soon after 1844 Daniel Foster planted a small nursery of apple and peach trees in Central Allegan. Ibid. p.292.

Most of the early settlers had small seedling peach orchards of their own planting. Ibid. p.292.

"S. K. Tanner, of Montery, still has a small peach orchard, mostly of budded trees, which were planted in 1849, and are yet [when?] fairly productive." Ibid. p.292.

[Ask Mr. Tanner]

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"There was but little demand for peaches from without the county prior to 1867 and 1868, but about this time the market at Chicago for this fruit began to attract attention, and farmers began the planting of peach orchards with reference to marketing the product abroad." Ibid. p.292.

Quite a good many men planted orchards of 100; 500; 1,600; 3,000; and 4,000 trres in the seventies. Ibid. p.292.

In 1874 a peach nursery was begun in Allegan and continues. Ibid. p.292. La Fleur also began a general nursery in 1875.

"One man received $1,000 for the peaches on less than four acres, without the trouble of picking and marketing them. The sales by another person from an orchard of ten acres amounted to $4,700." Allegan Journal on crop of 1879. Ibid. p.293.

Eastern Allegan. "In 1864 or '65 Jonathan Russel planted fifty peach trees, all of which are now living except one. * * * The varieties planted were Crawfords, Snow's Orange

and Hill's Chili. Two of these Early Crawfords the present season [1887?] yielded twelve bushels of fruit. This orchard is on very high ground with a west and north-west exposure. Since coming into bearing it has produced fruit every season." Ibid. p.293.

"The next peach orchard was that of John McIntyre, fifty trees of which were planted in 1876, and the remainder more recently. Ibid. p.293.

The third orchard is now (1887) three or four years old. (C. Aljo's).

The fourth of 1,700 trees belongs to Theodore Sessions and, is ~~most~~ the greater part four years old.

"There are now [1886? or '87] about 8,000 peach trees in orchard, planted within the last five years." * * * There is as yet no yellows in this town [Wayland], although cases are known to exist in the adjoining town of Hopkins." Ibid. p.294. The authority is apparently C. E. Davison, Secy. Wayland Horticultural Society. P. O. Wayland.

Lake Shore Region of Allegan County. "When the first white people came to this section, about 1835, there was a small peach orchard, on 'Peach Orchard Point', on the Kalamazoo river, supposed to have been planted by French traders." Ibid. p.296.

Some after 1840 "commenced the planting of seedling peaches." Ibid. p.297.

In 1864, McCormick and V. R. Wadsworth planted peach orchards on a lafge scale. Ibid. p. 297.

In 1872, farmers generally turned their attention to fruit-growing, a large share of which was peaches. Ibid. p. 297.

"Almost every farmer now [1887] has a peach orchard, varying in number of trees from a few hundred to five and even ten thousand."

Before the war (1860) small boats carried, from Saugatuck small loads of peaches, half grown and "fUzzy" to sell in the more northern markets among the lumbermen." Ibid. p.297.

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All statements on page 157 relative to Lake Shore region are by Harrison Hutchins, of Fennville.

Harrison Hutchins of Ganges township has ninty acres of peach orchard--seventy in bearing (date not given, probably 1886?), and his son has thirty acres more. Ibid. p.297.

Influence of Lake Michigan on temparature. Ibid. p.298.

"Senator Lewis has good reason to estimate the value of the peach crop of the lake shore towns at $200,000, and that of the town of Ganges alone at $50,000 to $70,000; and no one questions this; while from two warehouses in Douglas 147,593 packages of peaches were shipped this season; and from Fennville 137,500 baskets." Allegan Journal on crop of 1879. Ibid. p.299. [Probably peck baskets]

In the report of Saugatuck and Ganges Horticultural Society, 1881, appears the following statement: "The wildest prophecies about the extent of the fruit business of this region bid fair to be more than realized. From reliable data I [the Secretary] have ascertained that in the three towns

of Laketown, Saugatuck, and Ganges more than 200,000 peach trees will be planted the coming spring, and there seems to be as much eagerness to extend the area of orchards as ever." Ibid. p. 366.

KENT COUNTY.

In 1855, J. D. Alger planted peach pits south of Grand Rapids. The trees lived and bore well for many years.

"The peach crop is not as certain as upon the lake shore, but in 1883 more than 25,000 bushels were marketed from the orchards about Grand Rapids. All the peach orchards are on elevated locations. * * * Plantations are rapidly increasing. The profits are large but skill is required to secure them. The yellows has appeared in several orchards, but has not so far become a serious injury." C. W. Garfield in Brief of Hort. Ibid. p.324.

At Lowell, one peach orchard of 1,000 trees planted in 1880, has yielded $400 to $1,000 annually for some years. The peach orchard of the writer[Husted?] twenty-five acres, produced in 1883 a net return of $2,450. Ibid. p.325.

OTTAWA COUNTY.

Peaches were sold in Grand Rapids in 1839 by Allen Stoddard of Ottawa Co. from pits planted on his place in 1836 by his wife. Ibid. p.327.

Between 1836 and 1855 many orchards were planted, some of them probably being peaches. Ibid. p.327.

In 1868, T.E.Gidley planted extensive peach orchards, on peach plains, a short distance from Grand Haven. Two years later A.O. Ewing set a peach orchard near Grand Haven. Ibid. p.328

"In 1870 large peach orchards were planted at Holland by Delos Dutton, John Vischer, and Mrs. J. Heklines. Peaches were planted extensively in the vicinity of Holland in 1875." Ib. p.328.

"The exportation of fruit may be said to have commenced from 1871-73." In 1872, 8,432 baskets of peaches were exported. "From that date to the present the increase of shipments has been very marked." Ibid. p.328. County shipments for 1885 ~~was~~ were 21,300 baskets; value $9,325. Ibid. p.328.

In 1858 George Lovell planted a large peach orchard in the county for commercial purposes. Ibid. p.329.

In 1871, 18,000 baskets of peaches were shipped from Spring Lake. Ibid. p.332.

Much data on peach product but years not given. Ibid. p. 332.

In December 1872, D.R.Waters, of Spring Lake, estimates the peach crops at 16,000 baskets and says there were planted closely about the village 65,000 peach trees. Ibid. p.332.

[Cold winters put an end to successful peach growing here] visit this locality & determine whether "yellows" followed up the cold-winter injuries. ask Waters if it did.

WASHTENAW COUNTY.

"There are a few [peach] orchards here which bore large crops in 1874. These have gone through the cold winter of 1874-5 without injury to the trees, are finely ~~finely~~ filled with blossom buds this spring [1875], and seem every way thrifty and healthy." Jacob Ganzhorn. Ibid. p.257.

"Mr S. W. Dorr in 1879 stated that there were about 250 acres of peach orchards in the immediate vicinity of Ann Arbor." Ibid. p.257.

[The State Census of 1884 showed that this county had 92,180 bearing peach trees or nearly four times as many as Berrien the greatest peach county in the State until yellows appeared].

COUNTIES GROWING PEACHES PRIOR TO 1860. LYON.

Lenawee - - -	1852.
Hillsdale, - - -	1851.
Branch, - - -	1846.
Cass, - - - -	185-.
Jackson, - - -	1854.
Calhoun,- - - -	1850.
Kalamazoo,- - -	1850.
Macomb, - - - -	1850.
Ingham, - - -	1836.
Oakland,- - - -	1850.
Eaton, - - -	18--.
Clinton,- - - -	1842 1858
Ionia, - - -	1839.
Kent, - - - -	184- 1855.
Saginaw, - - -	1856.
Muskegon, - - -	1840.
Grand Traverse,- -	1855.

17 Counties.

"But there is another malady, which I believe is unknown in New England, or at least I have never seen or heard of such a disease with us. It is by some called the yellows; and according to Mr. Coxe, 'the malady which destroys much the largest portion of the trees, has hitherto baffled every effort to subdue it; neither the source nor the precise character of the disease appears to be perfectly understood.' The trees are further stated to languish, the leaves turn yellow and they perish shortly. The disease is contagious, soon spreading through a whole orchard; and if trees are brought from a sound nursery, and planted on the same land, they usually perish during the first season. And the infected soil cannot be again occupied as a peach orchard until some years of intermediate cultivation. The only remedy I have heard of for the destruction of this disease, is to destroy at once the infectious trees, before the disease is communicated to the whole orchard; which according to Mr. Prince, of the Linnaean Botanic Garden, as stated in Thacher's Orchardist, is at the time the trees blossom in the spring." p.205, The New American Orchardist. By Wm. Kenrick. 8th Edition. Boston: Otis, Broaders & Co. 1848.

According to the same writer, Mr. Kenrick, pp. 204-205, the most extensive peach orchards he known of belong to Messrs. Ridgeway and Isaac Reeve, at Delaware City. He says they regularly thin out the fruit. He adds: "They prefer a dry soil, light and friable, on a foundation of clay, or gravelly clay, a good but not a very rich soil. Like all other good cultivator s, the whole land is always kept in cultivation. For the first two or three years, corn is raised in the orchard, but afterwards the trees are permitted to occupy the whole ground, nothing being suffered to grow beneath their shade, as this would rob the fruit of its nourishment. In Delaware where the climate is warm and the soil good, twenty feet asunder is the suitable distance recommended for the tree; while on the eastern of Atlantic side of New Jersey sixteen or seventeen feet asunder is deemed sufficient by some of their most experienced cultivators, on good soils; while further north, on poorer soils, a less distance will suffice."

According to J. J. Thomas, American Fruit Culturist, Auburn, N.Y., Darby & Miller, 1853, peaches are sometimes budded on plum to escape the borer. p.279. Mr. Thomas also

says, p.284; "The disease termed yellows is truly formidable. It is peculiar to the peach and nectarine. It has destroyed whole orchards in portions of the county, and for a time induced the entire abandonment of the peach culture in certain localities." * * * "It is quickly induced by inserting the bud from an affected tree into a healthy stock." * * * "No case is known where a decidedly developed case of this disease has ever been cured." p.285.

[Thomas repeats this statement in the last edition of his book. New York, Wm. Wood & Co. 1885.]

Thomas, p.285, gives a good account of the disease--describing both premature fruit and sprouts.

The Fruit Garden. By P. Barry, of Mt. Hope Nurseries, Rochester, N.Y.; New York City, C. M. Saxton & Co., 1857, devotes one paragraph only to yellows, p.363; says it is supposed to arise from negligent cultivation. Is said to be contagious. "It exhibits itself in a yellow, sickly foliage, feeble shoots, and small fruits, prematurely ripened."

In "Fruit Culture etc." By W. C. Strong, ex-president Mass. Hort. Society, etc. Boston. Houghton, Mifflin & Co., 1885, p. 93, it is stated that the peach is indigenous to a warm climate. [Is this so? We do not know its birthplace.] p. 94.

"In this country the results of grafting upon the plum have not been as satisfactory as would seem to be warranted in theory. Experiments {in this direction} have been limited, and, so far, the impression prevails that the trees are not as vigorous and healthy as those upon the natural stock. There is a great difference, however, in the varios plum stocks, the horse plum, the Canada, St. Julien, Damson, Myrobalan, etc., offering an important field for experiment, with the view to obtain exemption from the root disease known as the 'yellows', as well as to extend the culture to moist localities."

"In the great peach region centering in Maryland it is customary to take but two or three crops from an orchard and then root up the trees." p.94. This he says is because of yellows. He says: "By proper culture and judicious pruning the trees may be continued for twenty or even forty years, and doubtless even this period might be doubled. p.95. He

also, pp. 95-6, quotes Goessman and is inclined to think that fertilizers enable the tree to resist yellows or even recover from it. He quotes Transactions Mass. Hort. Society, 1882, part I. pp. 120 and 130.

"Peach Yellows.--This is by far the most serious disease to which this tree is subject. * * * it is stated by Prof. Goessman that chronic cases of 'yellows' have been recovered, after a treatment of three or four years, by the use of Muriate of potash applied to the roots." Ibid, pp. 106-7.

S. W. Cole, in The American Fruit Book, Boston, 1849, gives a very good account of peach yellows, including premature fruit. p.184.

The American Orchardist, By James Thacher, M.D., Boston, [When published?]

In "The Southern Apple and Peach Culturist, etc." By James Fitz, Keswick, Va., J. W. Fitz, editor; Published by J. W. Randolph & English, Richmond, Va., 1872, I find the following: "It [the peach] was introduced into this county

about the year 1629. The stones were ordered by the 'Governor and Company of the Massachusetts Bay in New England' in that year. [But not their sent, - only promised]

"Both the peach and nectarine, as well as apricots, are mentioned by Beverly, as growing abundantly in Virginia in 1720. Some of the former [fruits] are represented to have been twelve or thirteen inches in circumference. They were raised so easily that some cultivators planted orchards of them purposely for feeding hogs. * * *

"Peach trees * * * are mentioned by Colden as having been killed by frost, in the province of New York, in 1737. * *

"The peach was introduced into Louisiana by the Spaniards [?] [see p 240] prior to its settlement by the French, where it has since grown spontaneously, and in many respects apparently indigenous.

"This tree was introduced at Easton, Talbot Co., Md., by George Robbins, in about 1735. The stones were received by [from] Peter Collinson, of England, together with the seeds of that year." p.225.

"In the more southern climates it [the peach] frequently attains the age of thirty or forty years--and is never attacked by the disease called the yellows." Ibid. p.229.

On page 252 , (Fitz),the statement is made that peaches take yellows when budded on the plum and apricot.

He says also of yellows that the "rich alluvial soils" of the North West "has in a manner limited its progress." [?] p. 251.

Also pp.249-50.--"The yellows is a most fatal disease, supposed to be constitutional with the peach tree. Its ravages, however, as far as the author's knowledge extends, seems to be confined at the present time to the Northern and Eastern States, and some portions of the West--the fine peach growing sections of the South and South-west being nearly exempt from this formidable malady. It belongs exclusively to this country, etc."

This author says that hot water or suds poured around the tree is the most effective way of destroying the borer in all stages without injury to the tree. pp.259-60.

[Is that an explanation of some hot water cures of peach yellows? It may be.]

This author, page 304, also says: "As far south as Florida the peach tree is long-lived, healthy and vigorous, and is never subject to injuries from the peach worm, or the diseases which so universally afflict the fruit in the Northern and Western States."

Melocoton is proper spelling.

"Root Gout" of the peach. p.267 of The Hardy Fruit Book, Vol.I., By T. D. Fish, London, L. Upcott Gill, 170, Strand, W.C.; no date, but recent, between 1880 and 1887. Describes a disease in which the roots are distorted into swollen knots or warty rings. This is undoubtedly a disease due to nematode worms, although the author has no suspicion of it. He says such roots develop adventitious buds and send out suckers. [Ask Dr. Neal, Archer, Fla., if this growth of suckers occurs there.]

Of "Jaundice or Yellows" Mr. Fish says: "This is not very common, though a mild form of the disease is often met with." He devotes two inches to it, but the reader is not clear whether he has our yellows in mind or only a yellowing due to some other cause. p.268.

The apple root blight is said to be due to Pemphigus pyri

and
p.458 of Baker's "Practical Scientific Fruit Culture" Boston, Lee & Sheppard, 1866.

Dr. Fitch recommends"a strong solution of soft soap." The roots should be immersed in these when the trees are removed from the nursery. They form excresences in the roots.

Page 473 of Baker, quoting Berkeley, speaks of dropsy in in plants due to prolonged rainy weather. In such weather the circulation is slow and the evaporation small. Growths at such a season are watery and tender, and the fruit is almost without flavor. Foliage of young shoots may become white or sickly yellow, and both fruit and foliage drop off prematurely. This of the apple.

A correspondent of the Farmers' Cabinet in 1839 states that in earlier volumes of the same Journal he has found eighteen papers recommending "alkaline substances for the prevention or cure of the premature decay of pear and peach trees". He believes in this remedy himself. p.279. Genesee Farmer. Aug. 31, 1839.

"Peaches are a profitable article of culture in the country through which we have travelled. * * The profits would be far greater, if means could be adopted to prevent the early decay of the trees. The average continuance of a peach orchard is from six to eight years; and four crops of fruit are considered a liberal return. The disease which destroys the trees is termed the yellows. Would it not be commendable in the New Jersey State Agricultural Society, which has just been organized, or even in the legislature of that State, to offer a bounty for the discovery of a cure or a preventive of this disease? * * *

"The extent of the peach plantations will seem extravagant to some of our northern readers. Many growers have 10,000 trees, one 30,000; and at one place in Shrewsbury [Monmouth Co.], there are 50,000 trees growing contiguous and forming as it were one magnificent orchard." Notes on New Jersey Farming, p.131, of The Cultivator, Albany, N.Y. Sept. 1839.

[Correspond with parties in Shrewsbury, or visit in 1888 to learn present extent of peach industry.]

In The Cultivator, Albany, N.Y., 1840, p.95, under date of West Chester, Ct., Feb. 1840, David Foote asks the Editors what is the matter of his peaches. "I have a number of trees of the yellow kind which ripens usually about the first of October; but last season [1839] they bore fruit resembling the red rare ripe, and ripened about a month earlier than ever before. Now the question is: What is cause of this change of color and time of ripening? I cannot tell unless it is caused by some disease which may cause the premature death of the trees."

On p. 95 of The Cultivator, 1841, the yellows is distinguished from the borer by that Journal, which says: "Within a few years a disease called the yellows has destroyed many of the best trees or orchards in the Northern or Middle States."

The worm may be destroyed, but the cause of the yellows is not known.

Ibid. p.131, D. Tomlinson, of Schenectady, N.Y., June 28, 1841, tells now to destroy the borer, and adds: "The yellows is complained of at Poughkeepsie, N.Y., and in New England. It has not appeared here."

Ibid. p.128, Littleton Physick, Ararat Farm, Cecil Co., Md., July 6, 1841, recommends salt petre very highly for peach trees. His experiments began in 1836.

In The Cultivator, Albany, N.Y., 1843, p.182, C. Butler, of Plymouth, Ct., Sept. 1, 1843, says he has had experience with yellows. Thinks it is contagious, but has made no experiments beyond the common one of observing "that when one tree was infected, other trees standing near would be, unless the infected tree was immediately removed in which case the healthy trees would generally be preserved." He says: "I came into this country to reside early in 1801, and have resided here ever since. When I first came here peaches were plenty. They were not raised for market, but for the family to eat, preserve, and give to the neighbors and friends, and were almost as sure a crop as potatoes. This continued to be the case until 1810. In December, 1809, there was a very extensive and severe cold freezing turn, which killed nearly all the peaches in this vicinity, and as far west as to Lake Erie. Since then, for some cause unknown to me, it has been much more difficult to grow peaches in this part of the country; but no more difficult on plowed land than on sward."

In A. J. Downing's Catalogue published in 1842 or '43, he describes the yellows as follows:--

"I. The yellows is the greatest malady of the peach. It affects the whole tree, and the seedlings reared from it are also more or less diseased in the same manner.

"II. The yellows is a contagious disease, spreading from tree to tree gradually, and it may be propagated by grafting or budding from the infected specimens.

"III. This malady may be infallibly known by the following characteristics: a decidedly yellowish color in the whole of the leaves of the tree; short and slender branches growing here and there, clothed with small, half-starved narrow leaves one-fourth or one-half the usual size; and mottled, small fruit of inferior quality ripening before the proper season..

"IV. A single tree with this disease will, by its contagious influence, gradually destroy a whole orchard of healthy trees. No pruning or mode of treatment, hitherto discovered, will restore to a healthy state a tree thoroughly diseased with the yellows.

"V. It is absolutely necessary to destroy all trees having the yellows, in order to insure a sound condition in a young plantation yet healthy, etc." The Cultivator, Albany, N. Y. 1843. p.103.

In 1843 Isaac Reeves' peach trees were dying of yellows by the score, "maugre all his care, cultivation and circumspection." John Delano, of Delaware. Ibid. p.167.

"Manual of Gardening for Bengal and Upper India." By Thomas A. C. Farminger, M.A., Third edition, Calcutta: Thacker, Spink & Co., 5, Gov't. Place. 1874.

This author says that there are only three distinct varieties of the peach cultivated in India:--1. The Saharunpore peach; 2. The Flat China; 3. The Calcutta.

"In this country the peach makes such vigorous growth of wood, that shortly after the close of the rains some artificial plan is necessary to be adopted to assist it in ripening." p. 240. The general impression one gets is that the peach is not very successful in India, especially on the plains.

"A Short Treatise on Horticulture." By William Prince, of Flushing, Long Island, N.Y., Printed by T. & J. Swords, 127, Broadway, 1828. Treating of peaches, this book contains the following on yellows:-

"There are two causes which have operated against the success of this tree, and which seem peculiar to it--the

one is a worm which attacks the tree at the root, near the surface of the ground, and often totally encircles it; the other is a disease usually denominated the yellows. * * *

* * * *

"Yellows.--This disease which commenced its raveges in New Jersey and Pennsylvania about the year 1797, and in New York in 1801, has spread through several of the States, is by far more destructive to peach trees than the worm, and is evidently contagious. This disease is spread at the time when the trees are in bloom, and is disseminated by the pollen or farina blowing from the flowers of diseased trees, and impregnating the flowers of those which are healthy, and which is quickly circulated by the sap through the branches, foliage and fruit, causing the fruit, wherever the infection extends, to ripen prematurely. That this disease is entirely distinct from the worm is sufficiently proved by the circumstance, that peach trees which have been inoculated on plum or almond stocks, though less affected by the worm, are equally subject to the yellows--and a decisive proof of its being contagious is that a healthy tree, inoculated from a branch of a diseased one, instead of restoring the graft to vigour and health, immediately itself becomes infected with the disease. As all efforts totally to subdue it must re-

quire a long course of time, the best method to pursue towards its eventual eradication, is to stop its progress, and prevent its further extension--to accomplish which the following means are recommended, which have been found particularly successful.

"As soon as the tree is discovered to possess the characteristics of the disease, which is generally known by the leaves putting on a sickly yellow appearance--but of which the premature ripening of the fruit is a decisive proof--it should be marked, so as to be removed the ensuing autumn, which must be done without fail, for if left again to bloom, it would impart the disease to many others in its vicinity; care is also necessary in its removal to take out all the roots of the diseased tree, especially if another is to be planted in the same place, so that the roots may not come in contact with any of those of the one which was diseased.

"If your neighbor has trees infected with the yellows in a quarter contiguous to yours, it will be necessary to prevail on him to remove them, that yours may not be injured by them. By being thus particular in speedily removing such trees as may be infected, the disease is prevented from extending itself to the rest of the orchard, and the residue

will consequently be preserved in perfect health at the trifling loss of a few trees annually from a large orchard." pp. 14 and 15.

"The cultivation of the Peach and Pear on the Delaware and Chesapeake Peninsula", By Jno. J. Black, M.D., Wilmington, Del., 1886.

According to Dr. Black: "Yellows has been known on this peninsula since the war of 1812, and is supposed to have been introduced from Pennsylvania, by carrying down improved trees, but it never amounted to a scourge until large orchards began to be cultivated from budded fruit." p.81. [Very True!]

On pp. 155-57 of Report of Secy. Mich. State Pom% Society 1872, is a tabular list of persons growing peaches in the vicinity of Spring Lake, Ottawa Co., Mich., in 1871. The total number of peach trees there given is 27,859,-about seventy growers. W. G. Sinclair was ~~chosen~~ chairman of the Canvassing Committee.

On p. 464, same report, is a paper on "Yellows in Peaches" by Dr. R. C. Kedzie. This report covers pp.464-483, and

bears date of March 30, 1872. I quote as follows: "The disease has only lately invaded our State. * * It was first observed in trees imported from New Jersey." p.469.

"Another symptom not noticed by Downing is a peculiar watery condition of the ripening peach, the taste being insipid." p.470.

By invitation of the Berrien county Horticultural Association, Dr. Kedzie visited Benton Harbor in Sept. 1871 and inspected a large number of orchards, "examining as far as possible all classes of diseased trees. Many trees exhibited the well-known symptoms of the yellows; viz. purple blotches on the prematurely ripened and somewhat insipid fruit, small wiry branches on the trunk and main limbs, bearing small leaves of a sickly yellow color, and here and there upon the tree shriveled and dry peaches still adhering to the boughs.**

"The soil occupied by peach orchards in Benton Harbor is for the most part a gravelly loam,--what would be called a quick and warm soil. In consequence of its porous nature, vegetable matter and humus tends to rapidly disappear from the soil. The liberal dressings of muck and marl which many have applied to their soils, show an intelligent apprehension of the nature and needs of their soil.

"I obtained for subsequent examination, specimens of diseased wood (roots and branches), leaves, fruit, and a quantity of ashes secured by burning the wood of a tree unmistakably diseased with the yellows." p. 472.

Speaking of the hot-water remedy recommended in the Gardeners' Monthly, Dr. Kedzie says: "A similar treatment of diseased trees in Benton Harbor, by placing ashes in a shallow trench at the root of the tree, and pouring over the ashes and around the roots boiling water, has resulted in curing the tree." p. 476.

"Analysis of Ash.

The ash obtained by burning a diseased peach tree was carefully analyzed; also the ash from a healthy tree growing in my garden. The results of the analysis are as follows:

	With yellows.	Healthy tree.
Carbonate of Potash,	7.24	10.38
Carbonate of Soda,	3.82	3.12
Chloride of Sodium,	.21	.13
Sulphate of Lime,	1.41	.92
Carbonate of Lime,	66.61	62.10
Phosphate of Lime,	13.16	15.71
Carbonate of Magnesia,	5.05	5.31
Silicic Acid,	1.40	1.21
Oxide of Iron,	.84	.92
Moisture and Loss,	.26	.30
	100.00	100.00"

Dr. Kedzie says the composition of ashes of the same plant will vary much according to the age of the plant, the kind of soil on which it grows, and the degree of vigor of its development. "Perhaps it might with justice be said that the results of chemical analysis, like those of microscopic examination, are merely negative." p.476.

"The most marked difference is the excess of carbonate of potash (3.06%) and of phosphate of lime (2.55%) in the ash of a healthy tree over that of the diseased one. Potash is the most characteristic element in the ash of land plants, just as soda is in the ash of sea plants. It is found in large quantity in the ash of young and vigorously growing plants, while it is deficient in those of feebler growth." pp. 476-7.

"Soils which contain minerals rich in potash (e.g. the feldspars) are capable of prolonged cultivation without exhaustion; hence the strong agricultural capabilities of clay soils." p.477.

"Now this deficiency of potash in the ash of the diseased tree, as far as it indicates anything, shows impaired vitality,--thus giving a chemical reason for the diminished vigor observed in diseased trees." p.477.

Dr. Kedzie believes in the contagious nature of the disease, but thinks that impaired vitality forms a condition exceedingly favorable to its development. To me the impaired vitality is rather a result of the disease. He says: "It is my opinion that not only is the tree enfeebled because it has the yellows, but it has the yellows because it was first enfeebled." p.177. This conclusion is not warranted by the facts.

[Latitude alone is no ~~fit~~ criterion of the fitness of a locality for peach growing.] except in a very general way.

Dr. Kedzie quotes Wm. Reid, of New Jersey, who says: "Eight or ten years is as long as we can get peach trees to live here." He says they invariably die off with the yellows. p.479. Quoted from the Horticulturist. 1861, p.129.

Consult writings of Mr. Fay in Prairie Farmer. He believed yellows to be contagious.

Dr. Kedzie says: "The woody growth of peach trees must be encouraged even at the expense of present fruitfulness." p.481. [In my observation the rapid growing, vigorous trees are quite as likely as any to develop the yellows.]

S. H. Wilson, of Baltimore Co., Md., in The American Garden, New York, 1887, p.72, writing on "Peach Yellows in Maryland", says that forty years ago, trees "rarely, if ever, failed to grow and produce large crops for years", even when neglected.

Some years before the civil war his neighbor set out ten or twelve acres of peach trees which did well. Seven or eight years later he set out two additional orchards of about the same size. "Before they came into bearing, the yellows, a thing heretofore unknown, attacked the old orchard and spread to the two young plantations; and I do not think his last two plantings produced a peck of fruit. Peaches had never before been planted on that ground; the land was plowed, the trees regularly wormed, and wood ashes thrown around the base of each."

When he came upon his own place seventeen years ago [1870] "it was nearly all planted with peach trees just coming into full bearing." Yellows was then present, and gradually spread until now but one tree is left, although he dug out, cultivated, and boned heavily.

Four trees set in 1870, one contracted the disease the third year; the rest after two crops.

In 1882 he set twenty-seven first class trees and kept the ground cultivated. "I have applied yearly kainit, high grade of muriate of potash, bone and wood ashes; look for worms a dozen times a year, head back one-half of every branch, and now a good share of these trees have the yellows."

"My soil is a heavy loam, subsoil, yellow clay."

"Peach yellows" p.372, Third Annual Report of the Board of Control of the New York Agricultural Experimental Station, 1884. Albany, 1885. In this Dr. Arthur says:

"No case of yellows occurs in the immediate vicinity of the Station [Geneva]. On July 11 a visit was made to several extensive orchards near Kings Ferry on Cayuga Lake, about twenty miles distant where x x x I had the opportunity of inspecting great numbers of sick trees in all stages of decline." Dr. Arthur could not satisfy himself whether these trees had yellows and also expresses a doubt whether it is a specific disease at all. From his account I judge it was yellows. In October seven miles from the station he also saw a few trees "which showed every external indication

of being in the last stages of the yellows." The cells were gorged with starch. "Careful examination was now made for bacteria. It was at once apparent that if present at all they did not occur in the obvious and abundant manner seen in pear blight. Bacteria were occasionally found, and in one or two instances seemed to be grouped at one spot, but there was no absolute proof that they came from the interior of the tissues." In the Kings Ferry trees "Some showed premature fruit, a few had small, wiry and somewhat fascicled branches, and the majority had yellows, often very depauperate foliage, tinged with red; but these characteristics were not often concentrated upon the same tree. The microscopic examination proved not at all more definite."

"Downing's Horticulturist states that in the county of New Castle, Del., there are about 2,500 acres devoted to peach orchards." p. 132 of The Cultivator. 1847.

Speaking of yellows, J. J. T. in The Cultivator, Albany, N. Y., 1844, says: "In Western New York it is comparatively unknown, and great care should be used by cultivators that it be not introduced by importations." p.255.

"Trees twenty years old and upwards are frequently seen in Western New York; and in the town of Farmington, Ontario Co., are the remains of an Indian orchard, containing peach trees a foot in diameter and probably fifty years old, in a bearing state." Ibid. p. 256.

"The 'yellows' in Peach Trees." By Noyes Darling, New Haven, Ct., Dec. 2, 1844. pp. 60-62 of The Cultivator, Albany, N. Y. 1845.

This valuable paper was evidently the result of experience, shrewd observation, careful reading, and good reasoning. I quote as follows:

"About 1795 peach trees in the neighborhood of Philadelphia, began to die without any apparent cause. Soon after they began to perish more and more remotely from that city. By 1810 few peach trees were left alive in the State of New Jersey. They began to die around New York about 1801, and in the Stae of Connecticut, about 1815." The unknown cause of this strange death was called yellows.

He makes a clear distinction between borers and yellows. "There are two marks or symptoms by which the presence of the disease is indicated. One is the shooting out from the body

or limbs of the tree of very small, slender shoots, about the size of a hen's quill. The leaves upon these shoots are commonly destitute of green color, as if blanched, or as if grown in a dark cellar, and like the shoots which bear them are of diminutive growth--rarely exceeding an inch in length. These shoots do not usually start from the common, visible buds at the points where the leaves join the stem, but from unseen latent buds in the bark of the trunk or large branches. The other symptom is the ripening of the fruit two to four weeks before its natural season of maturity. Most generally also, the fruit, whatever be its natural color, is more or less spotted with purple-ish red specks. If shoots, such as are above described, appear upon a ~~large~~ tree, or without them, if the fruit upon any part of it (not wormy) ripens before the proper time, it may be certainly known that the tree has the yellows." p. 60.

He says these are the most marked but not the only symptoms of the disease. "The ordinary leaves of the tree, or at least those upon the diseased portion of it, commonly undergo a slight change of color. Instead of a bright glossy green they take on a dull yellowish tinge. The wood also, where the disease is considerably advanced, becomes inelastic, so

that its branches, when moved by the wind, instead of the graceful waving of health, have a stiff jerking motion. These two last mentioned symptoms will not readily be seen but by a practiced eye." p. 60.

Mr. Darling sums up what further he has to say in twenty-one propositions. The substance of ~~the more important~~ of which I give below;—

1. The shoots do not ripen their wood perfectly. "They continue in a great degree herbaceous till frost comes." They perish the succeeding winter because of this, or because no buds are formed.

2. The fruit may be diseased before the shoots appear. "I have never seen the slender shoots on any part of the tree, without the fruit, if there was any, being affected."

3. Fruit is usually of proper size, the first season--much smaller after that.

4. "Whatever the natural color of the fruit--red, yellow, white, or green, it is more or less, when diseased, colored with purplish red; generally in specks or coarse dots. The flesh, quite to the stone, is often colored, and most deeply around the stone. By the colored specks a person can easily distinguish by the eye, diseased from healthy fruit, as it is offered in market."

5. "The taste of diseased fruit cannot be exactly described for want of appropriate words." The word insipid almost describes it. There is an absence of all agreeable flavor, and there is not much that is disagreeable. A few sorts retain, in spite of disease, some of their exquisite peach flavor.

6. The whole tree is not at once affected. Sometimes only one branch at first, "the rest of the tree having every appearance of health."

7. The tree sometimes dies the next year after the appearance of the disease, and sometimes lingers along with a feeble life for two or three years. Sooner or later, however, it is overcome by the disease. "I have never known, nor have I heard authentically, of any tree recovering from it."

8. "Soil whether clay or sand, whether moist or dry, whether cultivated or in grass, manured or unmanured, does not appear to me, clearly, either to increase or diminish the liability to disease."

9. "Trees standing in exposed and sheltered situations, walled and in open grounds, on hills and in valleys, seem alike and equally liable to the yellows."

I saw two such trees badly diseased in all parts in July, 1888. I found both dead in each of same year. much to my surprise, for they were apparently perfectly in 1887.

10. "Trees standing in places where people are passing to and fro very often near them, though not exempt from the disease, appear less liable to it than others. This is strikingly exemplified in the city of New Haven, where trees standing close by the sidewalks, outlive all others. The same fact I have observed upon my own premises."

I have observed Osages & roots around negro cabins in Washington where the earth is trodden hard by many feet.

11. "Luxuriant and vigorous growth is no protection against the disease. * * Slow growth is, perhaps, (I can not speak confidently) favorable to health."

12. "When the disease commences in a garden or orchard containing a considerable number of trees, it does not attack all at once. It breaks out in patches which are progressively enlarged, till eventually all the trees become victims to the malady. Thus in an orchard of two and a half acres all the trees were healthy in 1827. The next year two trees on the west side of the orchard, within a rod of each other, took the yellows. In 1829, six trees on the east side of the orchard were attacked; five of them standing within a circle of four rods diameter. In 1830, fifteen more were attacked; fourteen of which stood within a circle of four diameter. A similar fact is now [1844] apparent in my neighborhood. A fine lot of 200 young trees, last year in perfect health, now show disease in two spots, near the opposite ends of the

lot, having exactly six diseased trees in each patch, contiguous to each other, while all the other trees are free from any marks of disease."

13. "Young trees, even in the first summer of their growth, and before they have blossomed sometimes take the yellows. For this reason, many suppose the disease to be heriditary. Upon this point my observation has not furnished me with facts that seem conclusive.. Young trees from a diseased parent do indeed take the yellows; so do those from a healthy parent; and one, as appears to me, is as liable to do so as the other." Thinks this point not settled.

14. Is doubtful whether the disease is communicated through the blossoms. "I have not known a case where such a communication was clearly proved." Tried the experiment once himself--pollen of a diseased tree (one blossom) was dusted on a blossom of a healthy tree, - the only one on the tree. Tree did not contract yellows that year or the next.

15. "If a bud from a diseased tree is inoculated into a healthy stock, whether peach, apricot or almond, the stock will become diseased and die. As this fact is of some importance, I will furnish some evidence of it. I took some buds from a tree having symptoms of the yellows, and inserted

part into peach, part into apricot, and part into almond stocks. Some of the inoculations took well, but all showed marks of disease the next season. The peach and almond stocks with their buds died the second winter after inoculation. One apricot stock lived five years, but its peach top grew in that time to be only about three feet high." [Not explicit enough.]

16. "In an orchard or garden containing both old and young trees, the young tree will generally be diseased first, the old trees last." [Yes! U.S. 1891]

17. Thinks there is some difference in varieties. "I incline to the opinion that the Connecticut Red Rareripe and the Early Ann are the last to take the yellows. Dr. Monson of this city thinks a white cling of natural growth, 'endures the longest of any in a healthy state.' With the exception of those three varieites, all, whether old sorts originated in times beyond the memory of man, or new ones sprung the very last year from seed, appear equally susceptible of the disease."

18. "Peach trees budded on apricots, plums, and sweet almonds are liable to the yellows."

19. "Plum trees are not subject to any disease analogous to the yellows. But the apricot, standing in the neighborhood of diseased peach trees, is subject to a sudden decline, ending in death, which I can trace to no visible cause. The growth of the branches becomes feeble; manuring, digging, pruning, all have no effect upon the vigor of the tree. Nothing will save it. Yet I have not seen upon the apricot the slender shoots and the premature ripening of the fruit, which marks the disease of the peach. Nectarines are subject to the disease and show it in the same manner as the peach."

[I have seen, the terminal times 1870 shoots - 6,7 S.]

20. "The following fact gives reason to believe that the disease commences in a tree between the months of September and July folowing. In the month of September I took buds from a tree apparently in full health. The buds inserted into young stocks grew thriftily and without disease for three years. But the tree from which they were taken showed marks of disease in July following the time they were taken."

21. There is no connection between yellows and curl. Some of his conclusions are interesting. He notes that "The leaves of the terminal branches in the early stages of the diseese perform their functions regularly."

[There is no doubt as to this. My own observations are conclusive. It seems first to be a local disease then later on a general one, involving the whole tree.]

[May mistook October Nature!]

Concludes that something prostrates the vital power in the diseased leaves and fruit. Does not think it is a poison derived from the soil (8) nor from the atmosphere (12). "It cannot, I think, be owing to particular sorts of peaches having been propagated for a long period, and beyond their natural term of existence(13 and 17). It may be remarked that the early Ann mentioned in Sec. 17 is one of our oldest sorts."

"I think the disease cannot be ascribed to defective cultivation, to injudicious pruning, or injury to the roots of trees; for there was abundance of such cultivation, pruning and injury to roots before the 'yellows' made its appearance. The peach worm cannot, I think, be charged justly with the mischief; for thousands of trees have had the yellows which were untouched by the borer." He hazards a conjecture that the disease may be due to "some new, unknown, shy insect." Thinks that it has been gradually extending from place to place over the country and poisoning our peach trees.

He knows no means of warding off or curing the yellows. Mentions ashes, salt, saltpeter, urine, etc. "Some of them have seemed to promote for a time the growth of the trees, and to give a deeper green to their leaves; but none, that I have ever observed have at all checked the progress of the yellows."

Table of Frost. From the Meteorological Record kept at Middletown, Ct., By J. Barrat, M.D.

This table giaves for each year from 1831 to 1854, inclusive, the Latest Spring Frosts; First Autumn Frost; First Severe Fall Frost; and First Snow. By First Severe Fall Frosts he says he means such as "kills tender plants and flowers, and causes the forest leaves to fall." I copy this part of the record.

First Severe Frosts.

1831 - - - Nov. 4.

1832 - - -Oct. 29.

1833 - - - ~~~~ First light frost Sept. 14.

1834 - - Oct. 10.

1835 - - - Oct. 26.

1836 - - Sept. 30.

1837 - - - Oct. 5.

1838 - - Oct. 8.

1839 - - - Oct. 5.

1840 - - Oct. 16.

1841 - - - Oct. 14.

1842 - - Oct. 7.

1843 - - - Oct. 15.

1844 - - Oct. 2 and 21.

1845 - - Oct. 16.

1846 - - - Oct. 20.

1847 - Oct. 12 and 16.

1848 - - - Sept. 30. Snow Sept. 22 and 23.

1849 - - Nov. 1.

1850 - - - Oct. 14.

1851 - - Sept. 25. Oct. 16, white frost.

1852 - - Oct. 16 and 17.

1853 - - - ~~~~

1854 - - - Oct. 21.

From p. 131, Transactions of the Connecticut State Agricultural Society, 1854, Hartford, 1855.

Middletown is in North Latitude 41° 33' 8"..

March 12, 1855, Gordon W. Russell, of Hartford, Ct., writes: -

"Peaches generally succeed with us, especially in the city, but sometimes even here, the severe cold of winter prooves too severe for the fruit buds. An almost endless variety is raised, both of named and unnamed kinds. * * *

The disease called the yellows is very destructive, and has destroyed thousands of trees throughout the county, and will destroy thousands more, until cultivators will procure their trees from healthy localities, and will be willing to bestow some care and attention on them when planted and fruiting. The disease is eminently contagious, and is capable of being propagated, we believe, from blossom to blossom, by insects, and as yet we have found no effectual remedy." Ibid. p. 138.

Hon. John W. Niles, writing on "pomology" in Tr. Conn. Agric. Society, 1855, Hartford; Case, Tiffany & Co., 1856, p. 187, says: "Our severe and long winters and cold springs, render the peach an unreliable fruit here; yet it is worthy of cultivation for family use if not for market."

In 1866, Wm. H. White, of South Windsor, Conn., writes that peaches are infested with yellows and are generally "things of the past." p. 169. Report Conn. Board of Agric. 1866; Hartford, 1867.

Wm. C. Yoemans, of Columbia, writes (Ibid. p. 173): "Of

the peach, its cultivation is now nearly abandoned, and has been for a few years, in consequence of that scourge to that fruit known as 'yellows'."

D. W. Coit (Ibid. p. 168) says that the outdoor cultivation of peaches is mostly abandoned. He has grown them for a number of years successfully under glass. "This treatment protects, in great measure, from that fatal disease, the yellows, and trees remain healthy and fruitful."

Jno. F. Fitts, of East Windsor, says: "Peaches [were] plenty fifty years ago. Soil suited for them; grow well but die soon." p. 340. Report Conn. State Board of Agric. 1877.

As to abundance of peaches in early days in Connecticut, cite also p. 14, Report Conn. Bd. of Agric. 1883.- Auger on "Peach Experiences."

"Kaiserite is impure magnesium sulphate or epsom salts, one of the products of the salt mines of Stassfurt, in Germany." p. 89, Report Conn. Agric. Exp. Station, 1883?

There is a yellows law in Canada. Ask L. Wolverton, Secy. Ont. Fruit Growers Association, Grimsby, Canada, about it. — Garfield.

"Peaches. People in this region have become very much discouraged in regard to raising this delicious fruit. The trees have the yellows in many cases before they begin to bear, and if they bear at all, it is only for one or two seasons; seedlings, or some inferior sort, may be an exception. The choice standard varieties, if they bear so much as one season, do not last. One of your committe, ~~till~~ ten years ago, raised as fine peaches as could be desired, and in great abundance, but now, on the same ground, with much paind, is unable to get any worth naming.

"The theory of Van Mons, 'that the improvement of the quality of the fruit is at the expense of the life of the tree' and 'that those trees which produce the most delicate fruit are short-lived' may afford a hint in regard to the difficulty of raising peaches." Report of "Geo. Gabriel, A. S. Munson, V. M. Douw, H. Terry and W. W. Turner, Committee for the State of Connecticut." — "Proceedings of the Second Congress of Fruit Growers, convened under the auspices of the

American Institute." New York City, Oct., 1849. "Transactions of the American Institute, 1849." (Eighth Annual Report.) Albany, 1850, p. 275. Assembly No. 199.

A. J. Downing, Chairman of the General Fruit Committee, edited the Proceedings, and comments on the above report as follows:

"The explanation of the great prevalence of yellows in Connecticut, lies, we imagine, in the fact of the large introduction of later years, of unhealthy trees, bought indiscriminately in the markets of New York. A little attention to destroying every tree already affected, and introducing those of healthy constitution from other districts, will very soon result in the production of the finest fruit again, as has been abundantly proved in many parts of the State of New York." p.275.

At this date (1849) there appears to have been no yellows in Missouri, at least the Missouri Committee state that "the trees succeed admirably when kept clear of worms." p. 285.

Mr. Cromwell, near Baltimore, Md., was a "peach king" in 1834. Said to have been long known as such. P. 292.

Yardley Taylor, of Loudon Co., Va., in his report for Virginia says:

"Peaches succeed well here [1849]. It is no uncommon thing to see trees thirty or forty years old. The yellows occasionally are seen, and where no efforts are made to extirpate those that are affected, the disease has in some places destroyed many trees; but where pains have been taken to prevent it, the disease seldom appears. In comparing the time of ripening with Downing's work where the varieties are recognized, they ripen ten or twelve days earlier than at Newburgh, or New York." pp. 294-5.

A Flushing, Mich., writer on p. 246 of the Michigan Farmer, Niles, 1849, recommends budding peach on plum stock (Brompton). He has seen "peach trees on plum stocks that were over fifty years old, and yet thrifty and growing vigorously." [Not in Michigan, I conclude. Probably in England]

Peaches were grown in Ontario Co., N.Y., for some years prior to 1821. p. 169 of Michigan Farmer, Niles, Mich 1849. The writer remembers but one failure of the peach crop up to that date. This was due to frost in winter.

As long ago as before 1849 this same man (C. A. C.) had noticed at Avon that peach trees on "dry, elevated land" passed safely through the severest winters. Ibid. p. 86.

[Are peaches in any such locations less subject to yellows?] No. The orchards at Lawton & Grand Rapids, Mich, are in such situations.

BOOKS CONSULTED.

The Fruit Garden, P. Barry. New York, 1879.

Conn. Tr. Agric. Society. 12 Vols.

Comm. Report Bd. of Agric. 7 Vols.

Michigan Farmer, Niles, Mich. Vol. 7. N.S. 1849.

New Jersey Agric. Report. 1875.

California Tr. Agric. Society. 7 Vols.

"Many conjectures have long been afloat respecting the cause of the destruction of fruit trees, particularly those of the peach and plum. Some have ascribed it to a worm in the root, others to an epidemic, and affirmed, that when one tree was infected the disorder was communicated to others."

This writer "Agricola" attributs the disease to a coleopterous insect which he calls "scarabaeus," — "Size of a pole beam dark brown." They are in millions, buzz about and sting the tender branches. The sting poisons the juices of the whole tree; Causes the "leaves to turn yellow and crinkle and the tree to die." p. 392, of The National Register, Washington, D.C., Vol. I. 1818. Quoted from National Advocate.

"Of the imense amount of the peach business in New York we have already spoken. A single orchard (the Reybolds' in Delewware) supplied us during the month of August alone with 63,334 baskets [a basket is a short half bushel] and in September, probably more than half as many--making about 100,000 baskets from them alone. They have under yield 1,090 acres of ground, containing 117,720 trees. They send their fruit directly here by steamboat, and are making arrangements to supply Boston next year in the same way." New York Tribune. Quoted in Niles Register, Oct. 25, 1845. p. 128.

"Peach trade of Delaware.--Major Reybold and four of his sons sent off in one day 5,420 (five thousand four hundred and twenty) baskets of peaches, and up to the first of September, Major R. had from his own orchards sent off 16,000 baskets. By the first of September the several members of Major R's family had sent away upwards of 50,000 baskets." Niles' Register, Jan. 24, 1846. p. 332.

The following item, probably an overstatement, is from Niles' Register, 1843, Baltimore, Md., p.416:

"From the peach orchard owned by Jacob Ridgeway, near

[110 acres set at this date. See p. 268]

Delaware City, on Delaware river, forty-five miles below Philadelphia, in the year 1839, 170 acres, [?] in trees yielded 18,000 bushels of first rate fruit--only fifty acres being then in bearing. It now contains 300 acres of trees. ?

"A peach orchard owned by Major Reybold near Delaware City, it is affirmed, will this season yield to the owner the sum of $25,000. He has contracted to deliver to some New Yorkers 10,000 baskets at $2.50 per basket, amounting to $25,000, and a large portion of that complement has already been delivered."

Peaches at Spring Lake, 1867.

1,200	1,000	Kneeland, ~~of~~ Ganzhorn, & Co., had
300	1,100	150,000 young peach trees in
656	4,100	nursery.
300	4,000	- - - George Lovell.
600	1,000	Mr. Lovell's orchard was commenced
300	500	in 1858 and "now after nine
800	2,660	years growth is in full bearing
4,000	1,600	condition." p. 9.
1,500	500	
	2,000	
200	150	
700	1,950	
	31,116	- Number of peach trees in Oct. 1867,

in vicinity of Spring Lake, Mich. There were more than this as some were given in connection with apples, and I could not separate them. From "Spring Lake: Its Fruit Farms and Vineyards." p. 18. By Henry S. Clubb. An Address delivered Oct. 1, 1867, at Spring Lake, Mich. "Published by the Western Michigan Lake Shore Horticultural Association." Spring Lake.

Mr. Clubb says: "Land which was considered dear at five dollars an acre, three or four years ago, is now realizing, in the wild state, from $35. to $50. an acre, and where near the villages much larger prices, while cultivated and planted orchards and vineyards are worth from $300 to $800 and $1,000 per acre, according to age and locality." p. 13.

Mr. Clubb in "A Sketch of Northern Michigan" published at Grand Haven in 1872 in "Rules and Regulations etc." of the "Great Union Fair of Michigan" has the following on peach industry: quoted from Hartford Courant--editorial correspondence. [Simply statistics to show the profits of the business. Not specific enough to pay to quote.]

Mr. Clubb himself says: "Benton Harbor has excellent

shipping facilities and the country for miles around is a continuous peach orchard [1872], interspersed with cherry, plum, pear, and apple orchards." p. 102.

In 1846, in The Genesee Farmer, Rochester, N.Y., p. 94, P. Barry says: "The peach is an important fruit of our region. Our soil and climate are highly favorable for its culture. * * The peach worm is the chief difficulty we have to oppose, and that is not a serious one."

In the same Journal, same year, p. 242, Mr. Barry says: "There is no part of the United States where the peach tree is more healthy or attains a greater age than in Western New York. It is only improper soil or culture, and bad treatment that has caused early decay where it has occurred.

"The best orchards in this section now in full vigor are bordering on twenty years old. We have just been shown a collection of various fruits, by Col. Colby, of Ogden, and among others a fair-looking natural peach from a tree forty years old, yet healthy and productive."

See p. 130, Genesee Farmer, 1857, for account of the peach crop in Michigan.

According to Walter Phillips, "In the years 1869 and and 1870 peach orchards were planted at Holland, Michigan by the following persons: Delos Dutton, John Visscher, Mrs. J. Heckhins. In 1875 peach orchards were planted largely near Holland by C. H. Dutton, N. Diekema, , Arrand Visscher, Geo. Harrington." "Fruit culture in Ottawa Co." p. 269. Mich. Pioneer Collections. Vol. 9. 1886. Lansing, State Printers.

In 1868 peaches were set extensively on peach plain by Hon. T. E. Gidley. Ibid. p. 268.

I have examined all of

Niles Register, Baltimore, Md.,

1811-1847. Seventy-one volumes.

"A gentleman in Shrewsbury, New Jersey, [Monmouth Co.] will it is said, realize by his peach crop this year from $10,000 to $12,000 (We should have thought that every peach tree had been destroyed--if we could have believed the croakers, some time ago.)" Niles Register, 1835, p.70.

PEACHES.

"The Saugatuck and Ganges Fruit Region, etc.," By Henry S. Clubb. Published by the Lake Shore Agricultural and Pomological Society, Douglas, Allegan Co., Mich., 1875, [illegible]. pp. 1-20.

From this I quote and summarize:

No. of peach trees.	Saugatuck township--peaches.
3,270	"The first peach orchard planted for market purposes [in Saugatuck township] was that of Homer Manvell which was planted in 1862, west of the village of Douglas." p. 5.
40	
100	
1,000	
1,200	In 1874 Hugh Graham, of Douglas shipped 800 baskets of peaches from 800 trees planted in 1867. p. 6.
300	
1,500	
12	Daniel Gerber planted 300 trees in 1863.
10	
700?	
800	Mrs. John W. ~~Geie~~ Gill planted 7⅓ acres to peaches in 1862; in 1874 she shipped 1800 baskets. p. 6.
300	
799	
200	
218	
300	Miss E. Gill planted fifty trees in 1860. p. 6.
? Hanson.	
15	
1,000	

These figures represent number of trees different growers and said to have, the name of each grower being given.

500 P. Goshorn in 1875 had two acres of
400 peach trees twelve years old. p. 6.
300 J. S. Owen planted 500 trees in
400 1869. p. 8.
? Linn. David Porter planted 400 trees in
1,100 1867.
1,000 ? Manvel. J. F. Taylor planted 300 trees in
2,800 1864. p. 8.
40 Edwin Welch planted 200 trees in
50 1862. p. 9.
100 100 B. S. Williams & Son planted 600
112 trees in 1867, and 850 in 1869. p. 9.
1,100 Capt. Robt. Reed planted 500 trees
400 in 1866; 400 in 1868; 1,200 in 1872; and
600 700 in 1874. p. 10.

200
2,800
200
525
50
200
500 ? Weed.
400
3,000
4,360 No mention of existence of yellows.
300

33,301 - Total peach trees in Saugatuck township, in 1874.

Ganges township. Peaches.

"Most of the peach trees have been planted within seven years [since 1869] and are just beginning to bear profitable crops." p. 10.

No. of peach trees.	
240	R. C. Eaton planted 500 peach trees in 1862--in good bearing in 1874. p. 12.
1,500	D. French planted 500 trees in 1865. p. 12.
200	Dr. C. B. Goodrich planted 300 trees in 1862.
200	
400	
50	Levi Loomis planted 300 trees in good bearing in 1874. Some trees bore sixteen to eighteen baskets each. p. 14.
40	
150	
150	
650	Marion Loomis planted 500 trees in 1862.
600	
40	Andrew Plummer planted 100 trees in 1860.
50	
150	Elisha Weed planted 500 trees in 1862.
100	
300	
500	

20
500
175
50
300
? Goodrich, J.
500
40
500
500
100
500
2,500
100
1,100
990
50
1,000
300
800
500
266
300
450
200
300
900
200
300
521
600
200

"Powers, Benjamin F.--Four acres at Plummerville [near Perrotet's Pier] purchased of Mr. Perrotet in 1874, 140 peach trees in excellent condition. These trees were planted in 1862; they produced forty in 1866; eighty in 1867; two hundred in 1868; six hundred in 1869; and continued to increase, until 1874, when they produced 950 baskets of peaches. Several of the trees measure thirty-six inches around the trunk. One tree bore sixteen baskets of peaches. In 1873 there were 700 baskets of peaches produced in this orchard, which netted $1.25 per basket, being exceedingly fine peaches. Before the trees were planted the land, which is on an elevation, commanding a fine view of Lake Michigan, had been cropped heavily with ordinary farm crops. It was regarded as ex-

50
400
50
20
1,500
1,000
500
640
100
400
140
300
800
100
300
150
500
540
250
500
500
125
500
500
100

29,647 Total trees in Yonges township in 1874.

hausted land, and the year before planting Mr. Perrotet sowed oats and clover. The clover was allowed to grow two feet high and was then fed off. It was then dressed with tannery manure and plowed in. The trees were then planted and cultivated every year, with one or two exceptions. It is now in fine order, but has never produced a large crop of fruit. The trunks of the trees are remarkably sound, and so are the limbs; there is no appearance of exhaustion. The ground is completely covered, and the limbs interlace each other, the distance being only sixteen feet." p. 15.

[Make inquiries to determine whether this orchard is still living, and free from yellows.*]

No mention of existence of yellows.

* See p. 322.

Budding on plum stock not a protection from yellows.

Noyes Darling, of New Haven, Conn., under date of Feb. 10, 1846, in The Cultivator, 1846, p.141, says that four years ago B. Sillman, Jr., of New Haven, "procured from Liverpool a considerable number of young peach and nectarine trees, budded on plum stocks. Some of them were put for standards and others walled upon a board fence. There had been no peach trees for twenty years on the ground where these were planted. They grew well the first season and appeared in perfect health. The second season some of the peach trees showed symptoms of yellows, and died the third season. At the present time, [Feb. '46] no one of the ~~present~~ trees, either nectarine or peach is free from disease. In the garden adjoining that of Mr. Sillman there were diseased trees standing at the time the imported trees were planted out.

"The following inferences may perhaps be safely made from this experiment.

1. Budding on plum stocks is not a security against the 'yellows'."

2. This conclusion is that as plums do not have yellows the disease must have started in the peach part, i.e. in the top and not in the root.

3. This is that the disease did not arise from anything inherent in the trees, but from some cause external and disconnected from them, the trees coming from England where the yellows is unknown. "Mr. Downing states (Fruits and Fruit Trees of America, p. 467.) a further fact that 'notwithstanding the great number of American varieties of peach trees that have been repeatedly sent to England, and are now growing there, the disease has never extended itself there, or been communicated to other trees.' Peach trees in England, therefore, have no constitutional taint that makes them liable to the 'yellows', and if they remain there they never take the disease. But bring these trees to New Haven, and in fifteen months after their arrival they are dying with the yellows. There must be therefore something here which is not there. The disease shows itself too soon after reaching this country to admit of the supposition, that the exhausting processes, said to be peculiar to our climate and practices have an agency in producing it. Must we not suppose the disease to be connected somehow with the place rather than condition? It matters not where our trees or seeds come from--Liverpool, Flushing, Newburg, Western New York or Ohio,--if planted out

in New Haven or vicinity, either in light sand or deep, rich loam, they die of the yellows, some in one, some in two, all in three or four years."

* * * *

"I cannot, from my own experience, say confidently that it makes any difference [as to infection] whether the trees are rooted up when in full leaf or after the leaves have fallen."

[The belief at So. Haven, Mich., now is that cutting down the trees removes all danger. They do not remove them from the orchard at once. Often not for months. 1888.]

"At this time [1846] the extent of land set to peach trees in New Castle Co., Del., is stated [by J.W. Thompson, of Wilmington, Del.,] to be from 2,500 to 3,000 acres." The Cultivator, Albany, N.Y., 1846, p. 312.

Proceedings of the New Jersey State Horticulture Society 1886. Newark, N.J., 1887.

This contains Prof. Scribner's paper; and the discussion on yellows,— pp. 175-187.

At Port Penn, Del., the old orchards were all out in 1862 and the young ones not in bearing to any extent.

E. B. Pennington, Kennedyville, Md., Letter of Jan. 25, 1888.

Peaches are raised to only a very limited extent in Hartford Co., Md.—

James S. Harris, Still Pond, Md., Letter of Jan. 31, '88

Yellows is becoming general in South New Jersey.—

See J. McSmalley, Roadstown, N.J., Letter of Jan.30,'88

Quote all of this. [see p. 301]

Mr. Wyckoff says that Yellows still ~~exists to some extent~~ exists to some extent in Monmouth Co.,N.J. As a rule the orchards are now healthy and long-lived. One of his orchards has borne eleven successive crops and is now healthy. He thinks yellows is a root disease. The harm comes from contact of diseased roots with healthy ones. "We have never been without the disease in this county, but orchards are much more healthy and long-lived than they were twenty-five or thirty years back. They seem to have run out at one time, but are doing well now." David S. Wyckoff, Freehold, Monmouth Co., N.J., Letter of Jan. 28, 1888.

This man thinks yellows entirely the fault of nursery men in planting diseased pits. Thinks we have nothing to fear if sound trees are planted.

Yellows is present to a considerable extent at South Vineland. Quote from letter of John C. Wheeler, Jan. 27,'88.

E. Williams, of Montclair, N.Y., Secy. State Hort. Soc., knows no peach growers in New Jersey Counties named in my letter. There are no farms or fruit growers in Hudson Co. This county is made up of cities and marsh land. He will write to Ocean, Sussex, and Passaic Co., to determine for me whether yellows occurs.

Charles Miller, of Greenwich, Cumberland Co., N.J., reports yellows in all the orchards. Quote from his letter of Feb. 4, 1888. [Sec p. 303]

According to Wm. Redmond, of Jamesburg, Middlesex Co., New Jersey there is plenty of yellows in Middlesex Co., although he has none in his own orchard of 25,000 trees. He says he has cured trees in the last stages of yellows by pouring boiling water around the trunks. Questionable if he knows yellows, although he speaks of premature fruit--which he ascribes to wet weather, and of the wiry growths, which he thinks is due to the tree having been frozen, and should be cut off where

the top begins to branch, to allow a new growth to start. Letter of Jan. 31, 1888.

Geo. H. Schanck, of Freehold, Monmouth Co., N.J., has been in the business of peach growing ten years only. His trees are healthy and have done well, expect s them to bear for some time yet. There are two orchards adjoining his--one same age, one coming three years old. Has not heard of yellows troubling them. "I believe the orchards are free from the disease in this section." He set out an orchard last spring and the trees are looking well. "There is quite a call for trees at the nurseries, and several orchards are being set out here." The only trouble is the borer. Letter of Feb. 9, 1888.

Important letter from F. R. Dunlap, Delaware City, Del., on yellows in 1840-50. See these Notes further on for copy.-p. 268.

According to G. H. LaFleur, of Millgrove, Allegan Co., "yellows" first appeared in the township of Casco in or about the year 1874. "From that point it gradually spread until it reached Ganges and Saugatuck. I first saw it in the summer of 1876. By this time most growers became convinced

that the axe and fire were the only remedies, hence the disease spread not so rapidly as in the Southern part near the point of its origin." Three years after its first appearance at Fennville the disease appeared in Allegan township, in the center of a peach region in an orchard growing on some of the best soil in the county and on a favorable elevation.

"I think the disease prevails in nearly every town in the county where peach trees are growing. Although some parts are almost exempt as yet."

"The disease has reduced the number of trees in the eastern part of Allegan Co. 50%, although large numbers are annually being planted. In the west part of the county, where the disease first appeared, the number of growing trees has increased annually. The trees are immediately removed on the first appearance of the disease. In the eastern part very little attention has been paid to the yellows law, hence the almost total destruction of our peach orchards."

In the west part of the county peach growing has not been discouraged, ~~x x x~~ while in the east part the reverse is true.

Many instances have come under his observation where by the prompt removal of the diseased trees the yellows has been

kept in check; while where little or no attention has been paid to the removal of diseased trees, whole orchards soon became diseased and all the trees are now dead.

Letter of Feb. 6, 1888.

Yellows never appeared at Spring Lake, Mich., according to Frances Hall, but the trees were killed by the extreme cold. Once there were about 50,000, now not more than 10,000 and most all hurt badly. Few now planting. Attention turned to small fruits. Letter of Feb. 1, 1888.

[Determine if possible from other parties whether it is really true that yellows is not present. What becomes of the hard winter theory if this be true?] In 1873 Mr. Chamberlain showed another man in the Effect that yellows was present at Spring Lake. This man Saw discolored peaches in the market, & Went afterwards & examined & fd them on trees in an orchard, Mich. Pom. Rep. 1873.

Dr. W. S. Maxwell, of Still Pond, Md., says in letter of Feb. 12, 1888: "I saw very few peach trees on my trip through Hartford Co." He has written a Hartford friend asking information and will send it on when received. "The peaches grown in Western Maryland along the Blue Ridge mountains are the finest I have ever seen. They look like wax."

"Our Peninsular Hort. Society appointed a committee to secure the passage of a law in Delaware and Maryland compelling growers to destroy diseased trees." Wesley Webb, Editor Farm and Home, Dover, Del., Letter of Jan. 21, 1888. The meeting at which this was done was in January, 1888.

D. B. Williams, South Haven, Mich., says that his statistical report on yellows (See notes p.) made in 1882, covered only about two-thirds of the territory intended. Two other commissioners were appointed but made no report. None have since been appointed and no ~~real~~ record has been kept. Postal of Jan. 21, 1888.

Under contagium insert part of T. T. Lyon's letter of Jan. 19, 1888. — p. 296.

Peach on plumstock. Mr. Lyon says he is disposed to accept Jno. T. Edwards' statements as correct. See p.

Jas. F. Taylor of Douglas, Allegan Co. reports that he has never known of peach budded on plum stock. "We have plum on peach stock but no yellows has developed in such trees." Letter of Jan. 25, 1888. Quote some portions of this letter under "Effect of yellows law." — p. 291.

"I heard the other day through a party in Philadelphia that Jersey peaches were as badly affected with yellows as those from Delaware." W. S. Maxwell, Letter of Aug. 21, 1887. [Ask him to ask his commission merchant in Philadelphia if this report is true.]

Ex-Congressman Hon. E. L. Martin, Seaford, Del., says he has no yellows in his orchards and does know of its existence in that neighborhood. Letter of Sept. 14, 1887.

Col. Martin thinks nine-tenths of the diseases of peach trees can be traced back to the nursery. He would compel nurserymen to plant only healthy stock and bud healthy buds. Del. Farm and Home, Dec. 22, 1887. Address at Meeting of State Grange at Dover, Del.

Henry Race, of Pittstown, N.J., says in letter of Sept. 3, 1887: "You can reclaim them if the remedy [equal parts of bone and muriate of potash, four to six hundred pounds per acre] is used when the diseased condition is incipient; if much advanced take the tree out." [I cannot tell when trees

have "incipient" yellows, and probably others are as helpless. What he calls incipient yellows and is able to cure may not be yellows at all. We must know beyond any question that we have in mind the same disease before we can talk of cures.]

"We can't grow peaches here--too severe winters." Prof. J. Troop, Purdue University, Lafayette, Ind., Letter of Aug. 3, 1887.

"Mr. Minch is the only one I know who aserts positively he can or has cured trees of the yellows." E. Williams. Letter of Sept. 1, 1887. Eli Minch, Shiloh, N.J.

G.S.LaFleur did not succeed in making many premature pits grow. From one planting he obtained a few sickly looking shoots which only grew about ten inches and were pulled and burned. Next year he planted a peck--none grew. "August, 1882, I budded thirty-two sound stocks to buds taken from a tree showing yellows in the fruit but not in the tree itself. Eight of the buds started the following spring, 1883, Four started only perhaps one-half to one inch, and then failed to

grow and soon died; one bud grew three inches; and two buds grew eight to ten inches. All turned yellow and looked sickly in August of the same year and I pulled up the trees and burned them." Letter of Sept. 30, 1887. [Here was a great opportunity lost! Mr. LaFleur admits that the stocks should have been left in the ground and allowed to grow. Then he might have learned whether yellows can be communicated to healthy stocks by inserting diseased buds. It did not occur to him at the time. This is the very thing to be determined, for a diseased bud could not be expected to make a very healthy growth. Yet it might not give disease to the stock. If it did, it would be good proof of the contagious nature of yellows. He has made no other experiments.]

Dr. F. S. Dunlap, of Delaware City, says: "I have budded in different years from twenty-five to thirty trees, with the result invariably of giving yellows to the tree budded." * He is also sure he has conveyed the disease by the saw and the pruning knife. He has tried this on at least thirty trees.

"I have applied nitrate of potash, kainit, and wood ashes but have not succeeded in arresting or preventing the disease."

* Dr. Henry Ridgely many years ago budded a good many trees from a choice-looking premature ~~premature~~, and all died of yellows in a few years, none fruited. —Conversation in Aug. 1888, at Dover, Del.

Upon a farm in Kent county recently sold to A. C. Now land, Dr. Dunlap had about seventy acres in peaches. At the time he purchased it thirty-five acres were eight years old, and the other thirty-five were four years old. "The yellows made its appearance in the younger orchard near the top of two hills, and rapidly spread over the entire orchard. The disease did not make its appearance in the old orchard until three years later." Letter of Sept. 2, 1887.

In letter of Sept. 5, 1887, Dr. Dunlap relates a case where prompt removal of the diseased trees, 102 out of 3,300 four year old ones, seemed to check the spread of the disease. This was done in 1876, and in 1886 this orchard was in good bearing. Statements made on authority of John Carrow, St. Georges, Del. The orchard is on the "Henry Walker Farm" in Thoroughfare Neck, on Smyrna Creek, near Flemmings Landing.

[This talleys with J. F. Wilson's experience and Dr. Ridgely's. Visit this orchard in 1888.]

Garfield reports yellows present near Grand Rapids, in 1887. Several bad cases--on authority of the owner. See letter.

"The History of Virginia." By Robert Beverly. A native and inhabitant of the place. Reprinted from the author's second revised edition, London, 1722. J. W. Randolph, Richmond, Va., 1855.

[The first edition appeared in London in 1705.]

This author devotes a chapter which appears to be pretty full and accurate, to "Wild Fruits", but does not mention the peach. pp. 102-116.

In Chapter XXII, p.259, he treats of the "Natural Prod-. ucts of Virginia, and the Advantages of Husbandry." The first paragraph of this chapter is devoted to fruits, and concerning peaches, Mr. Beverly says:

"Peaches, nectarines and apricots, as well as plumbs and cherries, grow there upon standard trees. They commonly bear in three years from the stone, and thrive so exceedingly, that they seem to have no need of grafting or inoculating, if anybody would be so good a husband; and truly I never heard of any that did graft either plumb, nectarine, peach or apricot in that country, before the first edition of this book [1705].

"Peaches and nectarines I believe to be spontaneous, somewhere or other on that continent, for the Indians have,

and ever had, greater variety and finer sorts of them than the English. The best sort of these cling to the stone, and will not come off clear, which they call plum nectarines and plum peaches, or clingstones. Some of these are twelve or thirteen inches in the girth. These sorts of fruits are raised so easily there, that some good husbands plant great orchards of them, purposely for their hogs; and others make a drink of them, which they call mobby, and either drink it as cider, or distill it off for brandy. This makes the best spirit next to grapes." pp. 259-260.

"Records of the Governor and Company of the Masschusetts Bay in New England." Edited by N. B. Shurtleff, M.D., Vol. I. 1628-41. Boston, 1853.

On p. 24 is an undated memorandum of things "To provide to send for Newe England" among which are included--"Stones of all sorts of fruits, as peaches, plumbs, filberts, cherries." This was about 1628.

In a letter of April 17, 1629, from Gravesend, Eng., by the Governor and Deputy of the New England Company to Capt. John Endecott, then "Governor and Council for London's Planta-

tion in the Massachusetts Bay in New England" we read (p.392): "As for fruit stones and kernells, the time of the year fits not to send them now; so we propose to do it per our next."

"A Guide to the Orchard and Fruit Garden; etc." By Geo. Lindley. Edited by John Lindley. First American, from the last London edition. By Michael Floy, Gardener and Nurseryman, N.Y. and C.M. of the Hort. Society of London. New York. G.F. Hopkins & Son. 1833. The 2nd Ed, was published about 1845. The portion relating to peaches is about the same.

Mr. Floy (p.363) says he has had thirty years experience as a nurseryman in New York and in treating of peaches and nectarines (pp. 363-371) he discards Lindley entirely and writes a chapter of his own.

Peach budded on plum.

Mr. Floy says (p. 366): "The plum stock ceases to send up its sap earlier in the fall, causing the peach to perfect its wood before the cold weather sets in."

Mr. Floy had seen yellows in the vicinity of New York and mentions premature, red-spotted fruit as one of the symptoms. He says:

"About twenty or twenty-five years ago, peaches were raised here in the greatest abundance, and with only a moderate share of attention, in great perfection. That this time however has gone by, etc." p.363.

Aside from a possible change in climate he gives four reasons for this decay: First, Budding on peach stocks, which he considers have less hardy roots than plum; second, the borer; Third, a too rapid growth, forming a straggling tree likely to be broken down by high winds, and due also to budding on peach stock; and fourth, the yellows. Of the latter he says:

"The trees of late years are subject to what has been deemed a disease called the yellows, from the circumstance that the trees have a yellow sickly appearance;" * * *

In 1858, after a severe winter some of his own trees "ripened their fruit prematurely, without having anything of the true flavour; and what is remarkable, every diseased tree of whatever kind, seemed to bear the same red, and red-speckled, tasteless and insipid peach; some of them coming to maturity a month too soon." He says all of these trees "were perfectly sound and healthy the summer previous," and thinks the yellows was caused by the winter injuring the tree

without killing it. Says in every instance he found the pith of such trees was black-dotted or black. p. 365.

In 1829, a committee of six persons, was appointed by the New York Horticultural Society to visit gardens in the vicinity and "to lay before the Society an account of the general state of our Horticultural improvements." On the peach this committee reported as follows:

"Our cultivation of the peach is also succeeding in a degree approaching ot the prosperity of former years, and our markets, during the past season, have been supplied with great quantities of this delicious fruit, at from one to three dollars per bushel." p.75, of New York Farmer and Horticultural Repository, Vol.3, New York, 1830.

Milford Delaware Chronicle, Oct. 1883, by W.P.Corsa [no name signed]

"Yellows in the Peach."

"In a number of our peninsular exchanges we have seen accounts of a disease affecting the peach trees of their localities, that from its description, we judge is rightly called 'the Yellows'. The trees are reported to show the first appearance of the disease by prematurely ripening their

fruit, and the following year they put out a fine and abnormal growth of young wood; dying during the third year. The disease is also reported as spredding from one tree to those adjacent. This is so like"the Yellows" that we fear the unwelcome scourge of the peach orchard has come to torment our growers.

"It has hitherto been our boast that a genuine case of the Yellows was unknown on this peninsula. Because of the long exemption which peach trees have enjoyed from this disease, it was hoped that there had been found a country where either soil, or climate, or other conditions, were a barrier to the worst enemy of the peach.

"Whether it is the Yellows or not, that is killing the trees as reported, (we have not yet seen a genuine case of Yellows in Delaware,) prompt measures can be taken that will kill this disease.

"In our youth, we saw many trees taken in the early stages of the Yellows, and wholly cured with hot water treatment. A cavity was made in the earth surrounding the crown of the tree roots, and boiling hot water from the nozzle of a tea kettle was poured against, and around, the trunk of the tree, about a foot above the earth, until it ran down into the cavity about

the tree and quite covered the roots at the crown. This treatment will thoroughly cook the millions of threadlike fibers of the fungi, which, with a glass, may be found beneath the bark of the roots. By digging around the peach tree with the Yellows, there will be found a very sensible "Mushroomy" smell which is occasioned by the fungus growth beneath the bark. Of these fungus fibers the Gardener's Monthly says: "These eat the young fibers, and leave only the main root, through which all the nutriment of the plant has to be gathered; and as an old root is unable to do much more than draw in water, the tree becomes in a measure starved, and the leaves become yellow, just as they would be if growing in poor soil, which, though the plant might have plenty of roots, furnished nothing for the roots to eat. To have plenty of roots and no food, is equivalent to plenty of food and no roots. The effect on the plant is just the same. Hence, remedies which look to the destruction of this root parasite are employed. Hot water has done it; so has a weak solution of salt; others have found a solution of potash succeed. The exact nature of this fungus has not been investigated to entire satisfaction. This one may enter into the circulation of the plant, and exist in that ~~state~~ case as an apparently distinct species,

extending through the tissue, and destroying it as it goes. This seems likely from some experiments of the Department of [Thomas Taylors'] Agriculture. At any rate it is generally believed that a bud, or even a knife used in pruning a diseased tree, will communicate the disease to a healthy one.'

"The remedies suggested may be considered heroic ones, and by some it may be feared that hot water will kill the tree. But in the spirit of the German who was not certain if a man made a hog of himself that lager would not intoxicate though he had taken a hundred glasses a day without being drunk, so we say of hot water on the peach tree; it may be possible to kill the peach tree by flooding it, but we have generally used a half gallon of boiling water to a tree four inches in diameter, and have yet to see the first tree killed by it; and yet to see the first one so treated that was not benifited by the treatment.

"It may impossible for a man having a hundred acres in peaches, to treat his whole orchard to a hot water bath; but the yellows seldom attack a whole orchard at once; so if our growers will keep a sharp watch for the first appearance of the disease and stop the trouble there, they will find the task a less difficult one than they may now imagine. When a few trees have been thus found and 'doctored', it is good

judgment to put some ashes around the other trees of the orchard."

"Travels into North America." By Peter Kalm. Translated into English by John Reinhold Forster, F.A.S. 3 Vols. Warrington, Printed by William Eyres. 1770.

From Vol. I. of this most interesting book I quote as follows relative to peaches in America in the middle of the 18th century:

Philadelphia is in latitude 39° 50'. It was founded by Wm. Penn in 1682 or 1683. p.32.

Under date of Sept. 18, 1748, writing from Philadelphia about a visit to Mr. Bartram's country seat, four English miles south of Philadelphia, Kalm says:

"Every countryman, even a common peasant, has commonly an orchard near his house, in which all sorts of fruits, such as peaches, apples, pears, cherries, and others are in plenty. The peaches are now almost ripe. They are rare in Europe, particularly in Sweden, for in that country hardly any people beside the rich taste them. But here every countryman had an orchard full of peach trees, which were covered with such quantities of fruit, that we could scarcely

walk in the orchard, without treading on those peaches which were fallen off; many of which were always left on the ground, and only part of them was sold in town, and the rest was consumed by the family and strangers; for every one that passed by, was at liberty to go into the orchard, and to gather as many of them as he wanted. Nay, this fine fruit was frequently given to the swine." pp. 71-72.

[Here follows a paragraph telling how the fruit is dried for winter use.]

"The Peach trees have, as I am told, been first planted here by the Europeans. But at present they succeed very well, and require even less care than our [Swedish] apple and pear trees.

"The orchards have seldom other fruit than apples and peaches." p.73.

On Sept. 21, Kalm went nine miles north-west of Philadelphia to the country seat of Mr. Peter Cock:

"As we went on in the wood we continually saw at moderate distances little fields which had been cleared of the wood. Each of these was a farm. * * * Every countryman, even though he were the poorest peasant, had an orchard

with apples, peaches, chestnuts, walnuts, cherries, quinces, and such fruits." p. 88.

[at Peter Cook's]

Sept. 22. "They make brandy from peaches here, after the following method. * * * This brandy is not good for people who have a more refined taste, but it is only for the common kind of people, such as workman and the like." p. 94.

Sept. 26. "Mr. Bartram was of opinion, that the apple tree was brought into America by the Europeans, and that it never was there before their arrival. But he looked upon peaches as an original American fruit, and as growing wild in the greatest part of America. Others again were of the opinion, that they were first brought over by the Europeans. But all the French in Canada agreed, that on the banks of the river Mississippi and in the country thereabouts peaches were found growing wild in great quantity." * p. 127.

[Bartram's judgement in other matters was not very good]

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* The translator has the following foot note: he describes, and M. du Pratz, who has given a very good account of Louisiana and the Mississippi, says that the natives got their peaches from th English colony of Carolina, before the French settled there. P." p. 127. See quotation from du Pratz.

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[Bartram's judgement in other matters was very good]

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* The translator has the following foot note:

"Thomas Herriot, servant of Sir Walter Raleigh, who was employed by him to examine into the productions of North America, makes no mention of the peach among the other fruits

"Oct. the 27th. In the morning I set out on a little journey to New York, in Company with Mr. Peter Cock, with a view to see the country, and to inquire into the safest road, which I could take in going to Canada, * * *

"That part where we traveled at present was pretty well inhabited on both sides of the road, by Englishmen, Germans, and other Europeans. Plains and hills of different dimensions were seen alternately, mountains and stones I never saw, excepting a few pebbles. Near almost every farm was a great orchard with peach and apple trees, some of which were yet loaded with fruit." p. 216.

On this journey he mentions passing through New Frankfort and New Bristol, on the banks of the Delaware opposite Burlington in New Jersey. In the evening of that day (Oct.27) he reached Trenton, having there crossed the Delaware on a ferry.

Oct. 28. He continued the journey from Trenton, N.J., via Princetown, where they stopped over night. He found the country thickly settled.

"During the greater part of the day we had very extensive cornfields on both sides of the road. * * * Near almost every farm was a spacious orchard full of peaches and

apple trees, and in some of them the fruit had fallen from the trees in such quantities, as to cover nearly the whole surface. Part of it they left to rot, since they could not take it all in and consume it. Wherever we passed by we were always welcome to go into the fine orchards, and gather our hats and pockets full of the choicest fruit, without the possessor's so much as looking after it." pp. 222-3.

Oct. 29. Journey continued via New Brunswick:

"Almost near every farm-house were great orchards."p.227.

I find no other reference to peaches in Vol. I., and only one in the other two volumes. When Kalm was in Canada he notes the reported occurrence of peaches in the southern parts of Canada and to the south-west, in the Mississippi region, but makes no mention of having himself seen them.

"The History of Louisiana, or of The Western Parts of Virginia and Carolina." "Translated from the French (lately published) By M. LePage DuPratz." Two Volumes. London, 1763.

It is not clear from title whether Du Pratz was author or translator. In the preface it says the history "was wrote by a

planter of sixteen years experience in that country, who had likewise the advantage of being overseer or director of the public plantations, both when they belonged to the company, and afterwards when they fell to the crown." This history was first published in 1758. The translator ~~planter~~ in this preface says he took great liberties with the text to make it more readable.

From Vol.II., Chapter II. of this book, treating "Of the Fruit trees of Louisiana." p.17, I quote as follows:

"The natives had doubtless got the peach trees and fig trees from the English colony of Carolina, before the French established themselves in Louisiana. The peaches are of the kind which we call alberges; and contain so much water that they make a kind of wine of it. * * * Our colonists plant the peach stones about the end of February, and suffer the trees to grow exposed to all weathers. In the third year they will gather from one tree at least two hundred peaches, and double that number for six of seven years more, when the tree dies irrecovably [Borers?]. As new trees are so easily produced, the loss of the old ones is not in the least regretted."

[Contrast latitude of Maryland and Delaware with corresponding places in Europe and Asia.]

"Here [in Virginia] is such plenty of Peaches, that they give them to their Hogs; some of them, call'd Malachotoons, are as big as a Lemon, and resemble it a little." Vol.I. p. 440, of Sir John Oldmixon's, "British Empire in America." Second Edition, London. 1741.

On p. 515 of the same volume, speaking of Carolina, Oldmixon quotes from "Mr. Archdale" as follows:

"Everything generally grows there that will grow in any Part of Europe, there being already many sorts of Fruits, as Apples, Pears, Apricots, Nectarines, etc. They that once taste of them, will despise the watry washy Taste of those in England. There's such Plenty of them, that they are given to the Hogs. In four or five Years they come from a Stone to be bearing Trees."

[Other writers speak of Archdale as a trustworthy writer.]

Only one other mention of peaches in this volume and that is borrowed from Wm. Penn.

[Are plants or animals in high state of cultivation or improvement more subject to disease than others? Doubtful?]

"An Historical, Geographical, Commercial and Philosophical view of the American United States, etc." By W. Winterbothom, London. 1795. From this work I quote:

"In some counties [of Virginia] they have plenty of cider, and exquisite brandy, distilled from peaches, which grow in great abundance upon the numerous rivers of the Chesapeake." Vol. III. p.84.

"The apples of this State [Maryland] are large, but mealy; the peaches plenty and good: from these the inhabitants distill cider and peach brandy." Vol. III. p.36.

"In the county of New Castle [Delaware], the soil consists of a strong clay; [Except near Del. River] in Kent there is a considerable mixture of sand; and in Sussex the quantity of sand altogether predominates." Vol. II. p. 462. ~~What~~ Wheat was then the staple product of Delaware? So other writers also stole!

"Some Information Respecting America, collected by Thomas Cooper, late of Manchester." London, 1794.

Mr. Cooper left England in August, 1793, and re-embarked at New York for Europe in Feb. 1794.

I quote from this book as follows: "Every farm house in the middle and southern States has its peach orchard, and its apple orchard, and with all their slovenliness, abundance and content are evident in every habitation." p.51.

Price of peaches in 1793 in the Norfolk, Va., region 1d and 2d a dozen. Apples 6d a peck. p.96.

At Winchester, Va., the price of peaches was "from 2s to 4s per bushel," "Virginia currency which is reduced to sterling by deducting one fourth from the sum mentioned." p. 100.

"In Virginia and Maryland, peaches and apples afford peach and apple brandy; the latter is an indifferent spirit; the former, when well made, carefully rectified and kept in a cask for some years, is as fine a liquor as I have ever tasted." p. 121.

Mr. M'Allister, at Paxtong near Harrisburg, had an orchard of thirty acres, mostly apple trees. "He has several peach trees, but they have not long been planted." This man

had also a few apricot, but no nectarine trees. "He gives 6d a piece for apple and peach trees, about three or four years old, that is, fit to plant out." p. 129.

"Peach trees grow [same place] about the thickness of ones thumb, and four or five feet high in one year, from the stone and bear fruit in four years from the stone." p.130.

"The Semi-Centennial of the Admission of the State of Michigan into the Union. Addresses." Detroit Free Press Co. 1886.

From an address by Chas. W. Garfield, on "Michigan Horticulture" in this volume I quote as follows:

"By prompt measures the disease [yellows] which promissed to sweep everything before it, has been stayed, and the hope is born that soon we shall be able to resist its further encroachments." p.419.

"The advent of that paralyzing disease the yellows, introduced a new epoch in Michigan peach culture. It swept the industry from Berrien county before its power was known, and invaded the counties northward; but a careful study of the habits of the disease and protective legislation have

assisted the growers to meet the destroyer in successful combat. And although to-day little more is known of the cause of the disease than when it first invaded our soil, ~~its~~ its symptoms are so well understood and the most approved methods of warfare so thoroughly taught the growers, that its progress is not feared." p. 420.

"The History of Pennsylvania in America, etc." By Robert Proud. 2 Vols. Philadelphia, 1797.

From this book I quote as follows:

In 1680, Mahlon Stacy wrote a letter from New Jersey of which the following is an extract:

"I have traveled through most of the places that are settled, and some that are not; and in every place I find the country very apt to answer the expectation of the diligent. I have seen orchards laden with fruit to admiration; their very limbs torn to pieces with the weight, and most delicious to the taste, and lovely to behold. I have seen an apple tree, from a pippin kernel, yield a barrel of curious cider; and peaches in such plenty, that some people took their carts a peach gathering; I could not but smile at the conceit of it;

they are very delicate fruit, hang almost like our onions that are tied on ropes. Vol. I. p.153.

He speaks of wild fruits but evidently the peaches he saw were not wild. Stacy lived somewhere in "West New Jersey" probably not far from Burlington.* He was a member of the assembly in 1682, and one of the Justices for Burlington.

"In the year 1683, Gawen Lawrie, arriving Deputy Governor of East Jersey, under Robert Barclay, writes thus from Elizabethtown, to the proprietors at London, viz.

x x "All things very plenty; land very good as ever I saw: vines, walnuts, peaches, strawberries, and many other things plenty in the woods." Vol. I, p.155.

Wm. Penn, Proprietor and Governor of Pennsylvania, first landed in America, October, 1682. On Aug. 16, 1683, he wrote a long letter from Philadelphia "To the Committee of the Free Society of Traders, of that province, residing in London, containing a general description of said province" from which I quote:

"The fruits that I find in the woods are the white and black mulberry, chestnut, walnut, plums, strawberries, cranberries, hurtleberries, and grapes of divers sorts. x x x

* Stacy's letter was written from "Falls of the Delaware," April 26, ~~1682~~ 1680, to his brother Revell and others in England - see History of New Jersey by Jno. O. Raum - p. 108.

Here are also peaches very good, and in great quantities; not an Indian plantation without them; but whether naturally here at first, I know not. However, one may have them by bushels for little; they make a pleasant drink; and I think not inferior to any peach you have in England, except the true Newington." Vol. I. p.249.

In his chapters on the "General State of Pennsylvania between the years 1760 and 1770" this author says:

"In some places peaches are so common and plentiful, that the country people feed their hogs with them." Vol.II. p. 266.

"The Yellows in Peach Trees." By Noyes Darling. New York Farmer and Horticultural Repository. New York, 1831. pp.9 and 10.

I quote and summarize from this valuable paper, which is signed "Woodbridge, Conn. Dec. 21, 1830", as follows:

"The disease denominated the 'yellows' is rapidly destroying the peach trees in this part of the country (New Haven and vicinity), and, unless we discover some effectual preventive or remedy, we have reason to apprehend the entire extermination of that valuable tree. * * *

"The disease of which I speak is characterized by two peculiar symptoms; the premature ripening of the fruit, and the growth of very slender shoots from the body or large limbs of the tree. The first symptom is always manifest, if the tree has fruit upon it; but in the first season of the disease, it is rare that all the fruit is affected; generally that [on] one or two large limbs, ripen[s] three or four weeks too soon. The second season the whole tree is affected. The fruit may attain its full size, or may be no larger than a cherry[?]. [This last may not be a symptom of yellows?] Probably is not! All peaches whatever may be their color in a state of health(red, yellow, or white), are more or less purple when diseased. Ihave known one exception, and one only to this remark. [This exception may have been a premature due to borers] The color is not confined to the skin of the peach; it reaches even to the stone, producing either purple specks or lines throughout the pulp. The taste of the peach is insipid or slightly astringent.

"The second symptom generally, but not always, manifests itself the first season of the disease. The stem of the slender shoots varies in size from that of the smallest to the largest knitting needle. It is thickly covered with small leaves about half an inch long and one-eight of an inch wide, of a color reddish yellow or white. These shoots sometimes come out in clusters and sometimes singly, most

Starting two to shoot a year!

commonly on the body and large limbs, but occasionally near the extremities of the branches; if on the body they are found near the root. The tree attacked with the disease invariably dies, usually in three, always before the end of four years.

"Such is, I believe, a pretty accurate description of the 'yellows'." p. 9.

[Good! Darling's papers are more valuable than any others, early or recent, which I have seen.]

Mr. Darling takes up and discusses five theories of causation:

1. "'That the cause depends in a great measure on a defect in setting out the trees.'"

Objections.--"The disease attacks trees that have never been transplanted". × × "Besides, if this cause were the real one, it would have operated years ago, and in all places where this defective setting out was practiced; but we find that the disease made its appearance nowhere till within about thirty years, in this vicinity not till about ten years ago, in my own orchard and in the gardens of my near neighbors not till within three years, × × Why should this defective setting out produce the disease in 1830, in the same soil, subsoil, and exposure, where trees thus planted have flourished in health for ages?"

2. "That the 'late failure in our peach orchards has been more owing to causes arising from the natural termination of the duration of the sorts so long propagated, than from any extraordinary malignancy of disease'."

Objections.--"There are numerous orchards or at least gardens, in various parts of the country, stocked with superanuated sorts, which have never been affected by the 'yellows'. If his theory were correct [Mr. Wilson's], the disease would be confined exclusively to those sorts of trees which have passed their natural term of duration, while the new and renovated sorts would escape its ravages. Such, however, is well known not to be the fact, All sorts, new and old, either in stock or graft, are indiscriminately affected, whereever the disease prevails." [He cites many specific instances from his own orchard where in 1828-9-30 new varieties succumbed, also old sorts in his orchard as Early Ann, Lemon Cling, Yellow Rareripe, Red Rareripe yet unaffected.]

"There is one fact that seems conclusive against Mr. Wilson's theory, it is, that the 'yellows' has never appeared in Europe, where, if anywhere, various sorts of peaches have been propagated beyond the natural term of their duration.

"I will add further, that the 'yellows' is attended with a set of phenomena altogehter peculiar, and totally different

from those that result from the superannuation of the race. In the latter case the decay is gradual; the tree (the whole tree) is sickly, feeble, and unthrifty; the fruit if it bear any, is scanty and stunted, ripens in due time, and takes its natural color./ P. 10. no book

"In case of the 'yellows', the attack of disease is sudden, upon the most healthy, vigorous and thrifty trees, affecting at its commencement, but a single limb; the fruit is in great abundance, and often of full growth, ripens three or four weeks too soon, and assumes an unnatural hue. Consumption and yellow fever in the human body are not so dissimilar as superannuation and 'yellows' in peach trees."

3. "Improper or defective cultivation is assigned as a cause of the 'yellows'."

Objections --Like causes produce like effects "The disease makes its attack without any regard to the care ~~and~~ or skill of the cultivator; it makes no discrimination between the best and worst treatment."

4. "Some believe the 'yellows' to be the effect of injury done by the peach worm (ÆEg~~iore~~eria exitiosa)."

Objections.--"The known visible injury which the worm does to the tree, is the devouring of the inner bark around the trunk at or just under the surface of the ground. The

INTENTIONAL SECOND EXPOSURE

natural effect is just the same as that of girdling the tree, as far as the bark is so eaten. If the whole circumference is eaten round, the tree must die; if partially eaten, the the tree will languish and become unthrifty for want of nourishment in proportion to the extent of the wound. x x x We have a right, till the contrary is proved or rendered probable, to suppose that the worm does no more than we see. If so, we may say without hesitation, that the 'yellows' is not occasioned by the worm. There are two facts which if the worm does no more than eat the bark are decisive on this point. 1. The worm has been committing its ravages upon our trees for many years without any appearance of the 'yellows'. They have even girdled trees so as to produce death, without any of the phenomena peculiar to that disease. 2. Trees that have never, as far as we know, been touched by the worm, have died of the 'yellows', Of the two in my orchard which had the disease in 1828, one only had been wounded by the worm. Of the fifteen which took the disease in 1830, thirteen were free (and ever had been so) from any discoverable attack of that animal.

"5. *Mr. Prince ~~(i.e.~~ x x x Supposes the disease to be propagated by infection, by means of the pollen of a diseased tree, carried by wind or insects to the blossoms of

healthy trees." He also thinks it is contagious.

Objections.--"An experiment which I made last spring has not confirmed this statement. I inoculated a healthy young tree with a bud from a diseased one; the bud perished, and the stock continued healthy. I also applied a blossom, fresh from a diseased tree, to the blossom (it had but one)of a young tree in my garden, which has not yet shown any marks of ~~the~~ disease. I will state another fact. In the spring of 1829 I received two trees of the yellow nutmeg from Prince's Nursery. I suppose from their appearnce, that the inoculations were entirely the growth of the preceeding year. If they were, they could not have blossomed till transferred to my orchard. The growth of the trees had been remarkably vigorous, and nothing in their appearance indicated disease. Coming from a warmer climate they blossomed a week before any trees in my neighborhood, the blossoms had all fallen off before those in the vicinity had expanded. Nevertheless, both trees died of the 'yellows' before the month of September folowing. Another fact; last spring I had occasion to head down a young tree, very thrifty, but not of a sort that I approved. I left only one small twig, about six inches long, on which there were no blossom buds. In the course of the

summer that twig grew to the length of five feet, and to the size of a broom handle, with deep green leaves and every mark of most perfect health. The branches that sprung from the headed trunk were severely affected by the 'yellows'."

[Compare Mr. Green's Delaware Orchard in 1887. See Field Notes + Map.]

Facts favoring.--"That the disease should first appear in the neighborhood of Philadelphia and thence gradually spread in all directions, is one. My own observations may furnish some others. I have traced the disease from a single tree, in 1825, surrounded at that time for a mile with entire health, till garden after garden, within the extending circle, had become wholly despoiled of those precious fruit trees. In my own orchard, the two trees of 1828 stood within a rod of each other; of the six in 1829, five were within a circle of four rods diameter; of the fifteen of 1830, fourteen were within a circle of four rods diameter." But he adds: "I cannot, upon that theory, well account for a circumstance very often observable--a healthy tree standing two or three years, and blossoming every spring, within a rod of a large diseased tree, and yet continuing uninfected, while every other tree for rods around takes the disease and dies. [I observed a similar case in one of Dr. Maxwell's orchards. Only the healthy tree was surrounded by many diseased ones.]

"Some circumstances encourage the suspicion, that the disease is caused by a poison infused into the circulation, through a branch of the tree, by some unknown insect. If such an insect had first appeared about the year 1797, in the neighborhood of Philadelphia, and the successive generations had colonized the country in all directions, by progressive stages, it would account for the gradual spread of the 'yellows', from that desired [diseased?] center, and for most of the phenomena attending its dissemination. The effects of the disease on the suffering [trees?] are such, I think, as we might expect from poison--a debility or prostration of the vital energy, particularly in the leaf."

"All early travelers in, and writers about Maryland, have noted the fact that even before the first generation of settlers had passed, the country was thickly planted with orchards of apple and peach trees, which seemed to grow in the most flourishing way.

"It is certainly remarkable that within twenty-two years after the landing at St. Mary's [1634] orchards should have become a noticeable and even conspicuous feature in the landscape; but the evidence of the fact is conclusive: Probably

the exegencies of tobacco culture led to a rapid clearing away of the primeval forests, followed by speedy exhaustion of the soils first in cultivation, and the orchards were planted on lands about the houses which would no longer produce profitable crops of tobacco. The apples, however, were of an inferior sort, 'long stems' for summer apples, 'red spreaks' for winter." (cf. also Tyson's Memoir of the Ellicotts.) p.6, Vol. I. of J. Thomas Scharf's History of Maryland, Baltimore, 1879.

In a foot note Mr. Scharf also quotes from Hammond as follows: [For Reprint of Hammond's tract See Forces Hist. Tracts, Vol. 3, Washington, D.C. 1844]

"Hammond in his Leah and Rachel, A.D., 1656, p. 9 says: 'Orchards innumerable were planted', and again, p. 13, he says: 'The country is full of gallant orchards, and the fruit generally more luscious and delightful than here [England], witness the peach and quince, the latter may be eaten raw savorily, the former differs and as much exceeds ours as the best relished apple we have doth the crabb, and of both most excellent and comfortable drinks are made'." Ibid. p. 6.

"A new and Accurate Account of the Provinces of South Carolina and Georgia." London, 1733. Said to be by General

Oglethorpe. Reprinted in "Collections of the Georgia Historical Society." Vol. I. Savannah, 1840.

From this I quote:

"Mulberries both black and white, are natives of this soil, and are found in the woods, as are many other sorts of fruit trees of excellent kinds, and the growth of them is surprisingly swift; for a peach, apricot, or nectarine tree will from the stone, grow to be a bearing tree in four or five years time." p. 50.

"They have oranges, lemons, apples, and pears, besides the peach and apricot mentioned before; some of these are so delicious [evidently a paraphrase of Archdale, p. 7.], that whoever tastes them will despise the insipid watery taste of those we have in England; and yet such is the plenty of them, that they are given to the hogs in great quantities." Ibid. p. 51.

"An Impartial inquiry into the State and Utility of the Province of Georgia. London: 1741." Presumed to be by Benjamin Martin, Esq. Reprinted in "Collections of the Georgia Historical Society." Vol. I. 1840.

From an Appendix to this Inquiry, I quote a portion of a letter "from Mr. Thomas Jones to Mr. John Lyde, dated at Savannah, Sept. 18, 1740."

"As to our fruit, the most common are peaches and nectarines (I believe that I had a hundred bushels of the former this year in my little garden in the town), we have also apples of divers sorts, chincopin nuts, walnut,, chestnut, hickory and ground nuts." p. 199.

"The Resources of California." By John S. Hittel, San Fransisco, 1863.

From this I quote:

In California the plum suffers from the aphis or louse. p. 185.

The growth of fruit trees is very rapid. Peach trees one year from the bud have in one year grown "to have trunks from two to three inches in diameter." "These specimens of rapid growth were observed on an island near the junction of the Sacramento and San Joaquin Rivers." * * At Petulma * * a peach tree, one year from the bud, was eight feet high and eight and a half inches round." p.185.

"Mr. E.B.Crocker, of Sacramento, wrote thus in Dec., 1858: 'In Jan., 1855, I planted a small almond tree, with a stem little larger than a goosequill, and which I cut down

within a few inches of the ground. It is now a tree twenty feet high, sixteen feet through the top, with branches starting from the surface of the earth. The body below the branches is twenty-four inches in circumference.# (p.185.) * * An Old Mixon peach planted in 1855, and cut down to within a few inches of the ground, is now twenty feet high, twenty-two feet through the top, and the trunk twenty-eight inches in circumference.!" p. 186.

"It may be set down as a general rule that, previous to the time of bearing fruit, trees in California make twice as much wood in a year as they do in the Middle States." p.186.

"Peaches. The peach tree grows very rapidly, comes into bearing very early, and produces abundantly, in California; but nearly all varieties suffer with the 'the curl', which has given so much trouble during the last two years [1860 and 1861 apparently], that many of the orchards have been cut down. The varieties most free from the curl are the Late and Early Crawford, the Late Admirable and the Smock [See Ann Arbor Notes on immunity of Smock in Field Notes]. In the valleys and near the ocean, the peaches are not equal, either in size or

flavor, to the same varieties on the Atlantic slope; but in the Sierra Nevada they are fully equal to the Eastern fruit. The peach tree does not thrive in the high winds that prevail about San Francisco Bay. The trees are usually set out in orchard when one year old from the graft or bud; in the second year after that, they begin to bear." p.189

"The apricot thrives well and bears abundantly, especially in the warmer parts of the State. The fruit, however, in some places is much eaten by bugs and bees. * * *. The apricot tree is more healthy than the peach, and produces more abundantly; and its fruit supplies the place of the peach in many districts. (p.189.)

"The nectarine is affected by the curl and is not much cultivated." p.190.

"The cherry and soft shell almond thrive in all the valleys of the State." p.190.

"The almond and the English walnut both grow well and produce abundantly about Los Angelos, but do not thrive so well north of Santa Barbary. The almond suffers and loses its fruit with a slight touch of frost." p. 190.

"I know little if anything of the 'yellows'." Edwin H. Brown, Centreville, Md. Letter of July 13, '87.

"I would be very glad to have you here to-day to see a few as fine peaches as you have seen this season, taken from a tree on which there was one limb of premature fruit--that ripened some three weeks ago or more. The premature fruit was of fair size and ripened with the early varieties. The tree is a late Crawford." T. B. Coupsey, Springwells near Fredrica, Del. Letter of Sept. 6, 1887.

"At the peach meeting of our local society here [Grand Rapids] the other day one man reported several serious cases [of peach yellows] in his orchard. We have but one form of the disease in our State and this is the virulent type. * * *

"We can control the disease perfectly among thrifty orchardists because they will dig out every infected tree as soon as the disease develops. The malady is not now spreading in our State on this account." Chas. W. Garfield, Grand Rapids, Mich. Letter of Aug. 3, 1887.

"Peach trees will not live a single winter in Wisconsin." W.A.Henry, Director of Wis. Exp. St., Madison, Letter of Aug. 8, 1887.

"I have no 'yellows' in my orchards that I am aware of, nor do I know of it's existence in this neighborhood. It may be here, however, and I would be only too glad to have you come and make an examination." Ex-Congressman E.L.Martin, Seaford, Del. Letter of Sept. 14, 1887.

esp.

Delaware City, Sept. 2, 1887.

Mr. Erwin F. Smith,

Dear Sir:

Yours of Aug. 30th, rec'd. My experiments with peach yellows have been on a very limited scale and have been mainly in my own garden.

They have run through a period of from ~~ten to~~ twelve to fifteen years. I have budded in different years from twenty-five to thirty trees with buds taken from yellows trees with the result, invariably, of giving yellows to the tree budded.

I am perfectly sure that I have conveyed the disease with the pruning knife and saw, as the disease has made its first appearance in the parts of the trees first pruned after having used the tools upon a yellow tree. The experiments in pruning have been in, at least, thirty trees. The seed I used in my experiments have always been of natural fruit, some were sent me from North Carolina, the others, from Virginia, Tennessee and Kentucky.

I have applied nitrate of potash, kanit, and wood ashes but have not succeeded in arresting or preventing the disease. Upon a farm in Kent Co., Md., which I recently sold to A.C.

Nowland, I had about seventy acres in peaches. At the time I purchased it, thirty-five acres were eight years old, the remaining thirty-five acres were four years old. The yellows made its appearance in the younger orchard near the top of two hills and rapidly spread over the entire orchard. The disease did not make its appearance in the old orchard until three years later and never made its appearance in the bottoms. [?] The trees finally prematured from old age (eighteen years). I also sold another farm to Franklin H. Harper upon which I had planted a ten acre orchard, From the accounts from the agricultural club of Still Pond, I infer the yellows has visited that. A part of the trees in that orchard were obtained from James Shallcross at Middletown. Two varieties; Wainright's Ohio, a white peach, and Smocks, were grown on the Glen Cove farm and budded from trees in the old and healthy orchard. Mr. Harper can give you any information in regard to that orchard.

From my observations I think yellows can be conveyed by mere contact.

Respectfully yours,

F. S. Dunlap.

* [Examine this orchard in 1888 to see whether the varieties which came from the Glen Cove orchard show any less proportion of diseased trees.] Ex. in Aug. 1888 no disease

This orchard was destroyed by yellows in 2 yrs time!

Delaware City, Sept. 5, 1887.

Mr. E.F.Smith,

Dear Sir:

On Saturday I met and had a conversation with Mr. John Carrow, a farmer living near St. Georges, who in 1876 lived on a farm known as the "Henry Walker Farm" in Thoroughfare neck on Smyrna Creek near Flemings' landing. At that time he had an orchard of 3,500 trees, four years old. Discovered yellows in the varieties as follows.

He had of Mountain Rose 200 trees, found 20 yellow;

Yellow St. John 100 trees, found 2 yellow.

In Reeves, Moores Early, Old Mixon 1,200 trees of the three varieties he found eighty yellow trees.

He rooted out the trees at once, the next year he found two or three yellow trees in the orchard, since which time the orchard has been thrifty and one year ago was in good bearing.

This is his statement to me. He has an orchard on the farm upon which he is now living in which the yellows has made its appearance this year (four years old). He is using the same remedy, viz. extracting them. He states also that

he is very sure the pruning knife and saw convey the disease.

In a conversation with Gov. B. T. Biggs (I presume you have met him) I find he thinks he has a remedy for yellows in peaches, viz. Gas Lime applied to the trees when they are four years old, if correct this is a boon to the peach growers as it is both abundant and cheap.

I have had no experience with it.

Very respectfully yours,

F. S. Dunlap.

cds

Delaware City, Jan. 17, 1888.

Prof. Erwin F. Smith,

Dear Sir:

Yours of the 11th inst. came duly to hand. It was several days before I had an opportunity of interviewing the Messrs. Reybold and several others of our peach growers. I have sent you in my note what I deem the most reliable information that I can obtain at this late date in this locality.

The few persons, who were engaged in early peach culture in this county, yet living are very old men, and in most cases their memories are very bad. Mr. Reeves is an exception, likewise Col. Bowen. When the disease first made its appearance here I was but a lad and too young to take much interest in peach culture, yet I well remember the sad havoc it made in our orchards. My own experiments have been made in my own gardens here and upon my farms in Kent Co., Md., and principally between the years 1865 and 1886. If there is any information that you think can be obtained here give me the form in which you wish to have it and I will be happy to obtain it for you.

Respectfully yours,

F. S. Dunlap.

copy

Delaware City, Jan. 17, 1888.

Prof. Erwin F. Smith,

Dear Sir:

The first peach orchard in New Castle county, Del. to grow peaches for market, was on a farm, belonging to Jacob Ridgeway of Philadelphia, within a mile of Delaware City, and was set out by Isaac Reeves of Philadelphia, who was a partner with Jacob Ridgeway in the peach business.

Orchard,	Acres,	Planted,	In good bearing until	Taken up,	Remarks.
No. 1.	50	1832	1844	1847	No yellows.
No. 2.	40	1833	1844	1847	No yellows.
No. 3.	20	1835	1844	1847	Some yellows.
No. 4.	20	1836	1844	1847	Full of yellows.
No. 5.	20	1847	1851	1855	All yellow

The orchard No. 1, remained in good bearing longer than either of the three next succeeding. After thirteen years some of the trees prematured from the effects of the borer-worm, bad pruning and negligence. The orchard No. 3 showed yellows in nine years after being planted. Orchard No. 4 showed yellows in six years after being planted and at the end of ten years was worthless. Orchard No. 5 bore but three crops; the middle crop at four years of age, was a large and

fine crop. The third crop was neither abundant nor of good quality. The next year the trees were all either premature or yellow. Col. James Bowen, over eighty years of age, at present living here, who was an orchard foreman for Isaac Reeves, informs me that orchard No. 1 for a period of thirteen years never failed in producing a fair crop and a few of the trees of this orchard left standing continued to produce good fruit until 1852.

Mr. Clement Reeves, (a son of Isaac Reeves) says "the yellows never appeared in the first and second orchards, but after 1844 a number of trees in both of these orchards prematured. [Probably did have yellows] In orchards Nos. 3 and 4 between the years 1843-45 the yellows had full sway." Orchard No. 5 planted by himself was thrifty and apparently healthy until it had been planted four years; he obtained from this orchard three crops of peaches after which he had none that were marketable. The next to commence the peach culture was Major Philip Reybold who planted very extensively and was quite successful. His first orchard was planted about 1835 and every two or three years thereafter he set out an additional orchard. In this busines he was followed by his sons, the Clark brothers and others in 1837. In 1840 one-half of this section was covered

with magnificent peach orchards, the most of which continued in successful bearing until about 1848 to 1850; by 1855the yellows had taken possession of nearly all the orchards and peach culture in this section was at an end; however before this time many of our peach growers had purchased farms in Kent and Cecil counties, Md., where they planted extensive peach orchards and have grown peaches successfully there until about 1886, when the history of yellows seems to be there repeating itself.

Mr. William Reybold, (son of Major Philip Reybold) says "the disease that destroyed the orchards of this county was undoubtedly the yellows and if any one [is] familiar with peach culture [he] can hardly mistake the yellows for ordinary prematuring." This opinion is concurred in by other peach growers of this locality. I have not yet found any one who is able to tell me the cause of this disease, nor the cure, they all however claim that it is contagious. Wm. Reybold thinks it originated in the nurseries by planting seed from grafted or diseased trees, and budding from nursery trees or non-bearing trees. Mr. C. Reeves' [opinion] is that the soil has been robbed of some property necessary for the nourishment of the tree and fruit, or has gained some property from the air or other

source that is detrimental to the growth of the peach. Others believes the disease of the tree originates in bad cultivation, this idea I think has its origin in cases where the parties have not made a distiction between premature and yellow trees. I am very confident that neglect, careless cultivation, over-deep plowing, too free use of the pruning knife at the root in search of worms, wounding the bark of the root or body of the tree, is a fruitful means of producing the worm, and that in turn a sure cause of decay. Wm. Reybold says that the borer worm is never found in the roots of trees that have the yellows, while many other persons are equally confident the borer worm is always present in the roots of trees having the yellows.

Unless I have been mistaken in my observation I have found the worms plentiful in some trees suffering with yellows and been unable to find any worms in other trees of the same kind. [He is right!] In conversation with the old peach growers of this section I find few, if any made any searching or intelligent investigation into the cause of the disease until the most of the trees had died. I believe microscopical and chemical investigation would throw much light upon the subject. Many of our farmers after a lapse of twenty years

have set out new orchards which seem to thrive and do well until they are between two and four years old, when the yellows invariably makes its appearance, and the trees soon die. The most of the first orchards in this section continued in fair to good bearing for a period of from twenty to twenty-five years, and some even longer; whereas trees recently planted seldom live more than from three to five years, though planted in ground never before occupied by a peach orchard. For the cure of the disease I have used most of the remedies that have been suggested within the last twenty years but without any satisfactory results. Recently I have heard suggested gas house lime and more recently slacked oyster shell lime, neither of which I have yet used.

Respectfully yours,

F. S. Dunlap, M.D.

Col's

Vinyard, Spalding Co., Ga.,

Sept. 20, 1887.

Erwin F. Smith, [Co. is 30 miles S. of Atlanta]

Dover, Del.,

Dear Sir:--Your letter of inquiry received on Saturday. I have noticed only occasionally in the peach orchards in the country and occurring more often in the gardens and yards of the city of Griffin. Scattering trees (not often more than one or two trees) affected with a disease resembling the yellows. The whole tree usually assumes a sickly appearance, the leaves are very small and slender with a yellow death-like look. Late in the season or second season of attack the tree ceases to make terminal growth and a bunch or rosette of leaves forms on the tips of limbs making the tree conspicuous at a distance. Trees thus attacked are sure to die the second or third year. The symptoms differ from the yellows as known in Michigan. So far as I can learn it is not infectious, as single trees are often suffered to stand in the orchard until they die(which they are certain to do), and the nearest trees remain healthy. The small wiry shoots do not appear on the main branches as they do in the North, and I believe (though not quite sure) the diseased trees are barren of fruit from their finish attack.

[Ask him to make full observations and report in 1888]

Trees with this disease are very easily distinguished from starved trees (of these we have too many), and also from trees suffering from the bark grub. I was requested by the Middle Georgia Horticultural Society to make inquiries of the Department in regard to the nature of this disease and if if you can give us any assistance will be thankful. Peach and grape rot and curled leaf of the peach are serious obstacles in the way of complete success in fruit growing. If I can be of any service to you will take pleasure in so doing,

Respectfully, J. D. Husted.

Centreville, Md., July 22, 1887.

Erwin F. Smith, Esq.

Dear Sir:

Yours of the 13th was duly rec'd. excuse me for not replying sooner. we have never had the Peach yellows among us to know it. our's is a great Peach Country and although we are largely in the business and have been for twenty-five years I have never seen in our County a case of Yellows to know it to be such,

Very respectfully,

Sam'l T. Earle.

Freliegsburg, Ontario, Aug. 22, '87.

E. F. Smith, Esq.,

Dear Sir:

* * * The methods of analysis employed by us were the same as would be employed by any good chemist and vegetable histologist. If you instruct the Department Chemist that you want certain elements determined in the wood, he will be sure to give you an analysis that will compare with those published by us and by others. The elements you enumerate are those which should be determined; others would be of little or no value. I would suggest that you will find a soil analysis, however accurately made, by no means a correct indication of the capacity of the soil in meeting the requirements of nutrition. If you are to get exact data in this direction, you will probably find it necessary to institute a careful series of feeding experiments to compare with a parallel series of analyses of the wood and fruit.

You are probably aware of the fact that our mode of treatment has been tried in New Jersey for several years past, with a very considerable degree of success.

* * * *

Respectfully yours,

D. P. Penhallow.

Montreal, Sept. 19, 1887.

Mr. E. F. Smith,

Dear Sir:

Your favor of the 30th ult. came to hand on my return to the City a few days since. When you are in New Jersey, you would do well to call upon Dr. G. H. Cook of the Experiment Station at New Brunswick, and also upon Mr. H. H. Appleton, Odessa, Del. These gentlemen can give you information such as you desire, or tell you where to find it. You should also visit the Experiment Station at Amherst, Mass., where you will find the original trees experimented upon and cured. You should also see Dr. Goessmann with whom I was associated in the work, and who first advanced the idea upon which our final success was based.

* * * *

Your first step in dealing with your orchard is to give it a thorough pruning this fall, being sure to cut off all conspicuously diseased wood. The first object is to reduce the old wood to a minimum, so that with the special treatment, new and healthy wood may be formed. Then apply

Kieserite	25 lbs.
Muriate Potash	150 lbs.
Dissolved Bone-black,	450 lbs.

to the acre, one-half spring and fall, just before and after

leafing. If marked evidence of the disease is present, give an additional two pounds of Muriate of potash to each tree, spring and fall. Be careful not to allow the mixture to come in direct comtact with the roots, but keep it at least a foot from the trunk of the tree, spread as far as the large branches extend, and work it into the surface soil, allowing rain to do the rest. Mulch with sod ~~and~~ or straw. Some effect may be noted the first season, but more marked the second. If not very far gone, two or three years will probably complete the cure, but careful treatment will be needed afterwards to prevent return.

Very truly yours,

D. P. Penhallow.

copy

Mill Grove, Mich., Sept. 30, 1887.

Erwin F. Smith,

Dover, Del.,

Dear Sir:--Your letter of enquiry in relation to my experiments with buds and pits from yellows trees came duly to hand. My experiments have been so limited and upon so small a scale that there is but little benifit to be derived from them.

What I did do was to satisfy myself whether a tree could be grown and live to bearing age from pits or buds from peach trees having yellows. I had taken the position publicly that it could not be done. From the fact that I consider yellows similar in its nature and effects upon peach trees that specific diseases have upon animals, running its full course in a given time, and terminating in the death of the tree within a given period. And that time from three to four years, with decreasing vitality each year.

My first experiment was to plant pits taken from trees having yellows. About one peck were planted in the fall without cracking. None grew. But previous to this I had obtained a few sickly looking trees or sprouts from pits which were taken from trees having yellows. The growth was not to

exceed ten inches. They had the appearance of unhealthy trees. I pulled them and burned. The next season I obtained a peck of pits selected with care from fruit showing yellows plainly. These I placed in sand in the fall, in the same manner as I treated healthy pits. In the spring I cracked them myself and examined them, finding only one that was in normal condition. All others had turned a black or dark color and mostly decayed. The one pit that had the appearance of being sound was planted but never came up. The following August (1882) I budded thirty-two sound stocks to buds taken from a tree showing yellows in the fruit but not in the tree itself. Eight of the buds started the following spring of 1883; four only started one-half to one inch and then failed to grow and soon died. One bud grew three inches, one a little over four inches; two buds grew eight and ten inches high, all turning yellow and looking sickly, in August of the same year, I pulled up the trees and burned them. After doing this it occurred to me that the stocks should have been left in the ground to grow, to test the question as to whether yellows could be communicated to healthy stocks by inserting diseased buds. I hope that you will test thoroughly this last point, as that is of great importance to

know. If the disease can be communicated to healthy stocks by inserting diseased buds, that fact would prove yellows to be a contagious disease and not the result of starvation or any lack of elements in the soil. I hope the Government will realize the importance of this matter and furnish you with all the necessary means to continue the experiments and investigations already begun. A series of experiments should be continued for at least three or four years. These experiments need not be expensive but if carefully conducted will establish some facts that will settle many disputed points. It seems to me that if the Government would set some one investigating the disease in Michigan, that notes could be compared both in the East and West. The result would be of great importance. A few hundred dollars used in that manner might be used to great advantage. What we need is some experiments with this disease that will establish facts in relation to several points which are now only theory or conjecture.

Respectfully,

G. H. LaFleur,

Secy. West Mich. Fruit Growers Society.

P.S. Shall be pleased to hear from you again.

copy

Pittstown, N.J., Sept.3,1887.

W. S. Maxwell, Esq.,

Dear Sir:

The hurly burly of peach harvest has prevented an earlier reply to your note of the 22nd, ult.

As soon as your trees show signs of premature decay apply muriate of potash and bone dust, evenly mixed in equal quantity by measure. For trees that have not begun to bear apply one-half pint to a pint to each tree, spreading it as far as the branches extend. I would not put any on healthy trees before bearing. For trees four years old and more apply four to six hundred pounds to the acre, spreading it, or putting it in with a grain drill. If the trees are fruiting much, apply the mixture every year--in the fall ~~and~~ or early spring. If some of the trees show signs of decay, put on them a little larger allowance. You can reclaim them, if the remedy is used when the diseased condition is incipient; if much advanced, take the tree out. Thorough culture is necessary in all cases.

Your soil is different from ours. I will be glad if you will report to me the results of this treatment on your land.

I will be pleased to meet with your friend, E. F. Smith, when he comes to our State. If I can do anything to assist his researches it will afford me pleasure to do so.

Very truly,

Henry Race.

copy

M'Alisterville, Juniata Co., Pa., Sept. 9, '87

Erwin F. Smith, Esq.,

Dear Sir:

We send you to-day two packages of peach pits. The The trees which produced these seed were purchased at one of the West Chester Nurseries and planted in the spring of 1884, In sandy ground on a ridge with southern slope and exposure. Planted one thousnad trees and gave them good cultivation and kept off worms. Trees did grow (good-ing) and will produce about 750 crates of peaches this year (seven-eights bushel crates). About thirty of these trees showed disease by premature ripening, Commencing as early as the first of August. Varieties Smocks and Late Crawfords. Late Crawfords ripen here about the tenth of September and Smocks about the fifteenth, when healthy.

These premature peaches are free seeded with us as you will notice by looking at seeds.

We will remove diseased trees root and branch unless you will come to see us this fall and would prefer to see some of them in the ground. In that case we will let a few stand.

Yours &c.,

Smith & Bro.

copy

M'Alisterville, Juniata Co., Pa., Oct. 19, 1887.

E. F. Smith, Esq.,

Dear Sir:

In the hurry of shipping peaches, your letter of Sept. 19th was not answered.

Our trees bearing prematures do not send out such growth as we send you to-day the first season and sometimes even not the second. [See Note Book]

The twigs sent you before were off trees bearing prematures for the first time and do not show the wiry growth.

Your &c.,

Smith & Bro.

N.J. State Horticultural Society
Secretary's Office.

Montclair, N.J., July 23, 1887.

Erwin F. Smith, Esq., [Essex Co. N.E. N.J. near N.Y.]

Dear Sir:

Yours of the 21st at hand. A rainy day permits a prompt reply. When you reach New Jersey I would suggest you call on T. F. Baker, of Bridgeton, who will give you points in his neighborhood and perhaps take you to see J. D. Cole, [About 15 miles from Bombay Hook, Del.] of Deerfield and Eli Minch, of Shiloh, the Atheistical skeptic who does not believe there is such a thing as incurable yellows. If you go to Vineland, call on Col. A. W. Pearson, our president.

As you work your way up towards the centre of the State Ralph Ege, of Hopewell [Central West N.J. north of Trenton] is a large peach grower but he confesses he does not know much about the yellows.

John M. White, of New Brunswick, has visited the orchards of Middlesex, Hunterdon, and Somerset for the past two years for the Experiment Station, and is the best posted man I could refer you to.

The peach industry is not very heavy in this county but if you will call on me I wil try and show you around and possibly show you a case of yellows on my own grounds.

From here you could go to Morris, Sussex and Warren Cos. where the peach industry is quite an item. [Mts. in North N.J.]

Perhaps Samuel Brant of Madison could post you as to the most desirable points to visit, but of this hereafter, when you arrive here.

Respectfully yours,

E. Williams.

copy

Montclair, N.J., Sept. 1, 1887.

Dear Sir:

Yours of the 30th ult. just at hand. Mr. Minch is the only one I know of who asserts positively he can or has cured trees of the yellows.

Possibly he can show you the trees he has cured. I have seen trees undergo a remarkable change from a yellow, sickly appearance to a dark healthy green, from the application of muriate of potash. C. L. Jones, No. 8, Milford Ave., Newark, our Treasurer, has a tree in his garden of this kind, but I am not positive it was a "simon pure case" of yellows. Minch is your man. He goes to Boston 13th &c. Will you get through Jersey so as to join us?

In haste yours truly,

E. Williams.

Lawton Mich. Jan. 24, 1888.

Prof. Erwin F. Smith,
University of Michigan.

Dear Sir:- I have just returned home from a protracted absence in the Lake Superior region and find yours of 18th inst. waiting reply. The first appearance we had of the yellows here was in 1878. I think it had appeared in Mr Engles' orchard near Paw Paw the year previous to 1878 but that was the season we first recognized this disease here. Peach trees have been grown here since the first settlement of the region. The first orchard for market --500 trees-- was set by Mr. N. H. Bitley in 1858 and it survived and bore finely for 20 years until destroyed by severe winter and the yellows. No finer, healthier peach trees or peach orchards exist anywhere than were found here up to a few years ago. We have had several very severe winters--'84-'85 - '86, during which many trees were injured or destroyed. This added to the ravages of the yellows has caused our peach orchards to look somewhat ragged. In the season of 1881 there were shipped from this station upwards of 100,000 baskets of peaches. In 1883 perhaps as many, possibly as many in 1887.

Up to about 1875 there were not many shippers. There were but few orchards, still there were some that were proving profitable and the success of these few induced others to set out trees. The yellows seems to have gradually spread here from Benton Harbor. We heard of its appearance in the west part of the county

a few years before we discovered it here and were looking out for it, anticipating its arrival.

3. I do not know that I have seen any trees affected with yellows that were grown on plum stock, others might know, I do not. We have had yellows Commissioners since 1879 and one ~~for~~ year, 1885, I think, they kept an exact record showing the number of trees in every orchard examined and the number of trees diseased with yellows so as to give the percentage of loss. I have not the figures but I have kept track of the matter closely enough to be certain that the disease has not increased in any orchards when the proper attention was given, i. E. when the trees were destroyed as soon as they were known to be diseased. For instance, in Mr. Baxters' orchard were found more diseased trees the first year than were found there in any subsequent year. Mr. Halstead, in an orchard of say 2000 trees, destroyed more trees the first year that the disease appeared than he found in any year after that. He has an orchard that is 17 or 18 years old and it has very many of the original trees still, and in a healthy bearing condition. I have observed the matter carefully and have found invariably that when great care was taken to destroy the diseased trees and to give proper cultivation, etc. ~~too~~, those orchards have survived and given good results and on the other hand when the trees-diseased trees- were neglected, allowed to remain, the disease has invariably spread very rapidly and the entire orchard has soon disappeared.

I have one fact that has staggered me a little. I have a

single seedling peach tree in my lot at home which has stood in the ~~soil~~ sod for many years and sometimes ~~bore~~ bears a small white peach. I tried to inoculate this tree with the yellows several years ago but failed to accomplish it. In the month of June I pulled off a large piece of bark and applied in its place the bark freshly taken from a tree badly diseased and bound it on, but it never phased it. The tree kept on living the same, year after year, and is out there yet I guess though I haven't noticed lately.

I do not think that the loss from yellows amounts to more than say 5% a year, generally much less than that, frequently not above 1% of the trees in the orchard; trees are lost from other causes.

5. I think they have the yellows in Cal.* I have never been there so do not know from my own observation but I have relatives engaged in raising fruit in the vicinity of Los Angeles and they tell me that the disease exists there.

Respectfully etc.

C. D. Lawton.

* "I think it was Mr. Irving White, Sierra Madre, Los Angeles Co., Cal., who told me that the peach yellows existed in Cal." – C. D. Lawton Postal of May 25, 1888. See p. 375.

Douglas, Mich.

Jan. 25th. 1888.

Mr. Erwin F. Smith,
Ann Arbor, Mich.

Dear Sir:- Your favor of the 18th inst. came duly. It is quite impossible for me to give you such statistics as you ask for in your letter. I was Commissioner of yellows for this township (Sangatuck) for six years. When entering upon that work I attempted to make a list of diseased trees in every orchard and the varieties affected, but in a little time found that I could not carry out my plan. I could not go through all the orchards in our township, and examine every tree in the limited time in which such work must be done. As the larger part of our fruit men are anxious to learn how to detect the existence of yellows in their orchards it soon became evident that a little instruction would enable very many to take care of their own orchards. Then the Commissioner would only find it necessary to look after the careless ones. In this way we have succeeded in doing a great deal of work at a small expense of time and money. All peach growers who became thoroughly aroused to the destructive nature of the yellows have cut diseased trees without delay as soon as discovered. For several years after the disease made its appearance in this town, some men refused to cut their trees, but of late nearly every one cuts diseased trees, as soon as they are found.

~~285~~ 292

With these preliminaries I wil give such facts as I can bearing directly on your inquiries.

1. I do not know of any peach trees growing on plum Stock in all this region. I have lived here 20 years and have not known of the planting of any such trees. It has been a subject of conversation among fruit men and nurserymen but never put in practice. We have plum on peach Stock but no yellows has developed in such trees.

2. Yellows appeared here first in 1872 or 3 ~~3~~ * 4 ~~4~~. In an orchard south of mine about 2 miles one tree produced some beautiful red fruit. No one knew the cause of the changed color. This orchard contained about 300 trees. After this tree had borne such fruit a year or two it was pronounced diseased with yellows. The owner refused to cut it down and in about 8 years all of his trees (300) were dead by the effects of this contagious disease. Two miles east of mine another man found 6 ~~5 or 4~~ * trees in his orchard of 4 ~~10000~~ * trees, the same year (1872 or 3 ~~3~~ * 4 ~~4~~) which had the yellows. He did not know the appearance of affected fruit and went to St. JO. to learn what effect the yellows had on tree and fruit. He cut down and dug out these trees, planted new trees in their place which grew and bore fruit. This orchard has suffered but little from yellows. My neighbor has about 3000 trees. In the year 1878 I condemned 300 trees in his orchards. He cut out all that he found with marks of disease, but failed to find them all. Since that year he has cut all condemned trees and for the last #

* In letter D. May 5, 1885, in reply to my inquiries, Rev. J. T. Taylor author of the report sent me by Chairman Gillespie of the orchard. Cal. p. 336.

five years not over 20 per year although he has enlarged his orchards to 6000 trees. In my orchard of 300 in 1877 one tree had the yellows, in 1878 40 trees had the yellows. These we cut and dug out. In 1879 we found 6 trees with yellows. Since that time I have enlarged my orchard from year to year until they now contain about 3000 trees from one to fifteen years of age and no yellows have appeared since 1879. These cases are good illustrations of the whole township.

Every man within the range of my personal knowledge who has cut out all diseased trees without delay has not lost very heavily after the first year; while those who have delayed this work have continued to lose every year.

Very truly yours

Jas. F. Taylor.

[Middlesex Co.,
(North of Monmouth)]

Jamesburg N. J. Jan 31st. 1888.

To Erwin F. Smith, Esq.

Dear Sir:- Yours received and contents noted. About the year 1845 my Father commenced the culture of the peach and very successfully and at that time there was special attention paid to the inoculation of the young trees. No one would think of cutting buds except from young and healthy trees bearing fruit and as we bud in August and September the different varieties can be seen ripening in our locality at that time so that there can be no mistake made by this mode as you have a strong bud and the variety you desire from healthy trees and at that time you would not see the Yellows in one tree in a thousand with proper culture. But now it is different, the young trees are principally raised by nurserymen and the buds cut out of the nursery adjoining, a weak bud, and if diseased it is carried along for years without any attention being paid to it and sold to consumer and the same is true of mistake in variety which very often occurs, for instance, you cannot get any one now to warrant the fruit.
I attribute the whole trouble by this mode of inoculation, strongly advocate the old method as it looks reasonable and there can be no mistake made in the variety. This wiry growth you speak about I think is because the trees have been frozen and should be cut off where the top begins to branch and allow a new growth to start.

[Mr. Morris of Storrs did this.]

Premature ripening you can only account for, first too much wet weather and secondly, all yellow fruit should be planted on clay ground, white fruit on the light ground, there is as much of a sequel in this to be a successful peach grower than any branch of the peach culture.

I have no yellows in my orchard and I have in all about 25000 trees in bearing, but there is plenty of it around throughout the county produced by the former cause and bad tillage. Your peach orchard should be kept in as good condition as your garden. Great care should be exercised in the selection of fruit and when to ripen as to climate. Throw plenty of coal or wood ashes around the trees; this will, to a great extent, prevent the borer from working around the trunk of the tree but worms will hardly ever be seen in clay ground but they are at home in gravel or sand. I have cured trees in their last stage of yellows by applying boiling water thrown around the trunk, 2 or 3 pails and add a little salt. This will apply to an apple tree as well. The young trees should not be dug up in the Fall and trenched but let stand until Spring so that the roots will not bleed during the Winter and those buying trees should strictly observe this as I know it by experience but the grower of the trees will naturally differ with you in that respect as it makes no difference to him as long as he can effect sale of such goods, the sooner you will be ready to buy again from him or some one else in that line. Any farther information you desire in regard to the culture of this delicious fruit I will gladly convey at any time and how these few suggestions meets your approval. Please acknowledge receipt.

I am Sir, Resp'y Yours, Wm. Redmond.

Michigan State Horticultural Society.

President's Office.

Annual Membership $1.00.
Life Membership, $10.00.

South Haven, Mich., Jan'y 19th. 1888.

Prof. Erwin F. Smith,
Dear Sir:-

The yellows did not originate spontaneously in Michigan. It was introduced about the year 1862 (Hist. P 242) at Benton Harbor, where a tree of Early Crawford imported from New Jersey, ripened its crop of fruit quite in advance of the usual season of that variety. In ignorance of such disease this was treated as a sport and the tree was literally cut in pieces to supply buds for propagation. These carried the infection everywhere, so that the whole region was rapidly infected and in an incredibly short period, the entire peach interest of that region was swept away. [Cf. statement on p. 304]

wrong date.

1." How many years have peaches been grown at South Haven "? (See History of VanBuren Co. P 268 to 275)

2. Appearance of yellows- (In Hist. as above) first appearance at South Haven in 1872 - 3.

3. The peach interest at that time was already extensive and the trees free from disease.

4. I have never had observation of peach on plum stock. They are very rarely grown in this country and I have not known such a case since the appearance of yellows in Michigan. I am disposed to accept the statement respecting Mr. John T. Edward's peach tree

on plum as correct, (Report of 1873 P 26.) as the result is what I would expect.

I send you by this mail a copy of the History from which I quote, and in which - under head of Berrien and VanBuren counties you will see what information I have at hand on the subjects after which you inquire.

Very Respectfully

T. T. Lyon.

298

[Freehold, Monmouth Co., N. J.]
Jan. 28th. 1888.

Mr. E. F. Smith,

Dear Sir:

In answer to your letter with regard to peach yellows, I would say that they still exist to some extent with us, but we believe the disease here is entirely the fault of our nursery men in planting the pits of sickly fruit. If we procure good sound trees, we have no fear of the yellows, but if a few sickly trees are left in an orchard as the roots intermingle others will become diseased by them, so we cut out those that seem to be diseased. Our orchards are very healthy now, and trees long-lived, bearing as one of my orchards has done, 11 successive crops, trees now full of buds and looking well. I do not think ~~that~~ the disease you describe does harm to an orchard until the sickly roots have grown large enough to disease others,* then if not cut out, the whole orchard will be affected. We have never been without the disease in this Co. but orchards are much more healthy and longer lived than they were 25 or 30 years back. They seemed to have run out at one time but are doing well now.

Yours respectfully

David S. Wyckoff
Freehold,
Monmouth Co.,
New Jersey.

*In the young orchard of J. Alex, Fulton, Dover, Del. ~~the trees~~ the Trees are set 40 ft. apart + yet quite a good many of them have the yellows.

copy ok

299

[Allegan Co., Mich.]

Fennville, Jan 27th 1888.

Mr. Smith,

Dear Sir: This came to hand last evening. In replying to your No 1. I will answer Peach yellows made its appearance on the Lake shore about ten years ago and one or two years later about Fennville six and one-half miles east of the lake.

Your second. about Fennville I think one tenth of all bearing trees has been affected with yellows. Not near so large a per cent. near the lake. I am one and one-half miles west of Fenville and out of 5000 bearing trees I have lost near five per cent.

3d I think not. In some few instances perhaps might have been, but not generally.

For more extended and reliable information refer to Elder J. F. Taylor, Douglas. He lives on the lake shore, is President of the Pomological society here, has been Yellows Commissioner several years and is a man of good judgment and general information. My experience is mostly confined to my own farm.

Hoping to receive the benefits of your experiments, I remain

Yours truly

Harrison Hutchins.

copy

~~293~~ 300

Monmouth Co.

Freehold, N. J.

Feb. 9th 1888.

Dear Sir:

Your letter of Jan 23 received- Would like to give you the desired information in reference to peach yellows but cannot as I have been in the business only 10 years.

I can say my trees are healthy and have done well for me, expect the orchard to bear for sometime yet. There are 2 orchards adjoining me ,one about the age of mine and one coming 3 years old, have not heard of yellows troubling them. I believe the orchards are free from the disease in this section. Have set out an orchard last Spring, the trees are looking good. There is quite a call for trees at the nurseries, several orchards are being set near here. The crop has been paying better than grain and potatoes in this section of the county-- The only trouble is the grub worm which needs watching twice a year (in the fall and spring) girdling in spite of all attention.

Yours Affectionately

Geo. H. Schanck

Freehold,

Monmouth Co.,

N. J.

~~244~~

Roadstown, [New Jersey,]
1/30/1888.

Mr. Erwin F. Smith:

Yours of Jan 23 at hand, we have I am sorry to say what you are inquiring after, it is becoming general throughout southern N- Jersey. I have two orchards, one set four the other five years; one on land highly improved the other poor but see very little difference in disease. We have never been troubled much with it until within five or six years but it is on the increase attacking younger trees that are making good growth filling them with what we call water sprouts on the trunk and large limbs, do not know of any remedy.

Yours

J. Mc. Smalley.

~~295~~

[New Jersey]

South Vineland Jan 27th. 1888.

Mr. Smith,

Dear Sir:- Yours of 23d inst is at hand, the Peach yellows having all the characteristics you describe is present in my orchards and exists to quite an extent in this part of the country.

1st. It appeared in my orchard four years ago.

2d. I have dug out about six per cent. of the trees as useless and about four per cent. that showed premature fruit though otherwise apparently healthy for fear they would injure healthy trees.

I shall be pleased to answer any further inquiries if I can and shall be especially glad to receive and communicate to our Grange any information you may acquire in regard to the prevention or cure of this to us threatening disease.

Yours truly,

John C. Wheeler.

~~294~~ 303

[Cumberland Co.
near Delaware river]

Greenwich N. J.

Feb. 4th. '88.

Mr. Erwin F. Smith,
Ann Arbor, Michigan.

Dear Sir,-

In reply to your note of inquiry I will say the peach yellows are in all the orchards of this vicinity. The fruit on a diseased tree will premature and rot and a starved growth of shoots will appear on the branches or body of the trees.

It has not been of much injury to us until the last five or six years; with our orchards now, they will premature one-tenth or more the first year of bearing. It will begin to show in an orchard the second year, even before it begins to fruit. In some localities they do better than I have stated and others not so good. We think high ground, and not too rich, is the best soil for peach growing, as the trees grow we improve the ground.

Hoping these answers will be satisfactory,

I am

Very respectfully

Charles Miller

To,-

Erwin Smith,

Michigan.

~~97~~ 304

col 1 cont'd

[Mailed from Millgrove,
Feb. 6, 1888.]

Mill Grove, January 4, - 1888.

Erwin F. Smith,

Dear Sir

In reply to yours of the 25 inst. the exact date when the yellows first appeared in Allegan county I have not at hand. Consequently this statement may not be quite accurate in regard to the time. There is doubt existing as to the time of its first appearance in the county. I have heretofore made inquiry of persons and their statements differ. The first peach tree known to have yellows was at or near St. Joseph in the year ____ [Cf. p. 296] 1866 This tree had borne three crops before yellows appeared in the tree The disease soon spread, first slowly, gaining rapidly in the number of trees each year. The course traveled was east and north along the lake shore until it reached the town of Casco in or about the year 1874. From that point it gradually spread until it reached Ganges and Sangatuck. I first saw it at Fenville in the Summer of 1876. By this time most growers became convinced that the ax and fire was the only remedy hence the disease spread not so rapidly as it had in the southern part near the point of its origin. There is a pine timber belt in the county of Allegan running north and south about 5 to 7 miles in width, this separates the western part of Allegan county from the central and eastern portion. Three years after the first appearance at Fennville the disease made its appearance in the township of Allegan. It first

appeared in an orchard growing in some of the best soil in the county and on a favorable elevation. How the disease crossed the Pine belt and passed nearly three miles over land planted to peach trees and appeared in the centre of a region with peach trees planted for some miles west and east, seems to some a mystery. I have always been satisfied how the disease was communicated to that particular place. I have never given my idea about it to the public. It could have no bearing with you. I think the disease prevails in nearly every town in the county where peach trees are growing although some parts are almost exempt as yet. To your 4th question, the disease has reduced the number of trees in the eastern part of Allegan county fifty per cent. although large numbers of trees are annually being planted. In the west part of the county where the disease first appeared the number of trees growing has increased annually. The trees are immediately removed on the first appearance of the disease. In the eastern part very little attention has been paid to the yellows Law hence the almost total destruction of our peach orchards.

In the west part of the county peach growing has not been discouraged as [is shown by] the immense shipment of peaches annually and thousands upon thousands of trees being planted annually, while the east ½ is the reverse. Many instances have come under my observation where the prompt removal of diseased trees has been in practice the disease has been kept in check, while in orchards where little or no attention has been paid to the removal of diseased trees the whole

orchard soon became diseased and all are now dead. I hope to be favored with the result of your investigations in time. My time is so fully occupied with another matter on my hands that I have only given this matter a small amount of time and thought. If I have failed to give the desired information this time you are at liberty to make further requests of me and I shall cheerfully give you any desired information in my power.

Very Respectfully,

G. H. LaFleur.

"A relation of Maryland". Author unknown. "Reprinted from the London edition of 1635, with a prefatory note and appendix. By Frances L. Hawks, D.D., LL.D." N.Y. Joseph Sabin, 1865.

From this tract I quote as follows:—

"Although there be not many that doe apply themselves to plant Gardens and Orchards, yet those that doe it, find much profit and pleasure thereby: They have Peares, Apples, and several sorts of Plummes, Peaches in abundance and as good as those of Italy." — p. 28.

"The Founders of Maryland etc." By Rev. Edward D. Neill, A.B., Albany, Joel Munsell, 1876.

From a foot note I quote as follows:—

"George Minifie arrived in the year 1623, in the ship Samuel. His plantation was between Blunt Point and Jamestown. De Vries visited in 1638, the James River and in his journal writes: 'Arrived at Littletown where Menifie lives. He has a garden of two acres full of primroses, apple, pear and cherry trees, * * * Around the house were planted peach trees which were handly in bloom.'

"The Dutch Captain says that these were the finest peach trees he saw in North America." — pp. 52 & 53.

Ex'd N.J. Archives, 10 vols. Nothing on peach trees.

"Insects Injurious to Fruits". By Wm. Saunders, F.R.S.C. Philadelphia, J.B. Lippincott & Co., 1883. This is a good book to buy. From it I quote:

"No. 103 - The Peach-tree Aphis,
Myzus persicae Sulzer.

This aphis begins to work upon the young leaves of the peach tree almost as soon as they burst from the bud, and continues through the greater part of the season, unless swept off, as sometimes happens with surprising rapidity, by insect enemies. These lice live together in crowds under the leaves, and suck their juices, causing them to become thickened and curled, forming hollows with corresponding reddish swellings above; frequently the curled leaves fall prematurely to the ground [?] Here he probably confounds with curl due to Taphrina]. The perfect winged females are about one-eighth of an inch long, black with the under side of the abdomen dull green, the wingless females rusty red, with the antennae, legs, and honey-tubes greenish. The winged males are bright yellow streaked with brown, with black honey-tubes." - p. 199. Nothing is said about the occurrence of this insect upon the roots.

"A Practical Treatise on the Management of Fruit Trees etc." By George Jaffques, N.Y. 1856.

From this book I quote as follows:-

"The Yellows. This destructive disease has proved fatal to whole orchards, in some sections of the country. Its symptoms are, - 1st. a growth of slender, sickly, wiry shoots, with small yellowish leaves; 2nd, the premature ripening of the fruit two or three weeks earlier than its proper season. This disorder seems most disposed to attack rapid growing varieties." p. 272.

"Our Insect Enemies". By Theodore Wood. London, 1885.

From this book I quote as follows on

Dimorphism in Aphides:

"It is very likely that this singular fact of dimorphism may, when it is more thoroughly understood, clear up for us many of the mysteries now surrounding the life histories of certain aphides. There are many species, for example, with whose doings we are acquainted during a part only of the year. We find them busily engaged in feeding, perhaps, for a period of six or eight weeks, and then suddenly discover that they have vanished, to appear no more until the following season. We cannot trace them during the intervening time. We do not know whither they go, or in what stage of development they pass the winter. All we have ascertained is that they disappear from our ken for the greater part of the year, and we have hitherto altogether failed to discover in what manner and for what reason they do so.

"But if these species are dimorphous, the difficulty is at an end. Any of these aphides, after appearing in one form for a month or two, may then migrate, and show itself in a totally distinct shape upon a different food plant etc." - pp. 51 and 52.

"The peach tree suffers very much from the attacks of plant lice, which live under the leaves * * * Whether our insect [there may be several of them] is the same as the European aphis of the peach tree (Aphis Persicae of Sulzer) I cannot determine for want of a proper description of the latter." - p. 240 of 3rd Ed. of "A treatise on Some of the Insects Injurious to Vegetation" By T. W. Harris. Boston, 1862.

"Elliott's Fruit Book" By F. R. Elliott. Pomona Gardens, near Cleveland, Ohio. New York. 1854.

From this book I quote, premising that the author would have written differently had he been familiar with "yellows", and inferring that the disease was not then present to any extent in Ohio:—

"What is regarded as yellows is little known throughout the West; neither have we ever observed it, to any extent, in the New England States, except where trees were procured from, or grown on poor, sandy soils, enfeebled and imperfect from their first start. * * * Prof. Kirtland says: 'It is questionable whether any distinct disease occurs, to which this name is applicable. Perhaps it is only a collection of symptoms arising from causes acting either individually or collectively.'" p. 268.

"The following analysis, made by B. Kirtland, of Poland, Ohio, [not Jared P. to whom the book is dedicated] from three esteemed varieties, viz. Yellow Rareripe, Red Rareripe, and Morisconia will be found extremely useful etc. * */ Equal quantities of limbs and twigs from the three kinds above named [healthy], were taken and after having been thoroughly dried (whereby they lost about 44 per cent of water) carefully burned with a moderate heat, yielding as follows:

Charcoal & Sand	3.180	Lime	23.951
Silica	1.480	Phosphate of Lime	21.699
Perphosphate of Iron	2.174	Magnesia	7.052
Potash	12.545	Peroxide of Manganese	.800
Soda	2.000	Chloride of Sodium	.699
Sulphate of Lime	2.258	Carbonic Acid	33.356
			111.188
		Loss in Analysis	3.812
			115.000."

Page 263 & 264.

"The most vigorous healthy trees we have ever seen are growing on the borders of the Ohio River, on what is termed limestone soil, and where perfect drainage is naturally formed by the hills?" — p. 264.

Peach on Plum stock.

"In England where peaches are invariably raised upon walls, or trellises, they almost universally make use of the plum as a stock to graft upon. In our country, where peach trees grow so luxuriantly, we should not recommend this stock, as the scion not only outgrows it in a short time, producing an unsightly appearance, but is exceedingly apt to be blown down by the wind; the roots of the plum being of much slower growth are not sufficiently large and expanded to support the larger top or branches." — "The New England Book of Fruit". By John M. Ives, 3rd Ed. Salem, Mass., 1847, p. 103. — No mention of "Yellows."

"The New England Farmer or Georgical Dictionary" By Samuel Deane, A.M. Worcester, Mass. 1790.

From this book I quote:

"We have room for making great improvements, it seems, in the culture of this fruit [the peach]. What we call the ravenipe is almost the only sort I have seen that is worth cultivating. And this kind within thirty years [i.e. since 1760] seems to have greatly degenerated. I apprehend it is time that these were renewed by bringing the trees or stones from some other country." — p. 208. No mention of "yellows", or of any reason for this degeneracy.

"A History of New Sweden; or the Settlements on the River Delaware." By Israel Acrelius, Stockholm, 1759. Translated from the Swedish by William M. Reynolds, D.D. Philadelphia, 1876. being Vol. XI of the Memoirs of the Historical Society of Pennsylvania.

From this book which is more trustworthy than Campanius, and which was also written by a Swedish clergyman who spent some years in America, returning to Sweden in 1756, I quote:

"Peach trees stand within an inclosure by themselves; grow even in the stoniest places without culture. The fruit is the most delightful that the mouth can taste, and is often allowable in fevers. One kind, called clingstones, are considered the best; in these the stones are not loose from the fruit as in the others. Many have peach orchards chiefly for the purpose of feeding their swine, which are not allowed to run at large. They first bloom in March the flowers coming out before the leaves, and are often injured by the frosts; they are ripe towards the close of August. This fruit is regarded as indigenous, like Maize and tobacco; for as far as any Indians have been seen in the interior of the country, these plants are found to extend." — pp. 151 & 152.

Early History of Peach in Virginia.

"Before closing this article [on peach-tree], we shall present to our readers the method practised by Mr. Bayley, of Accomac County, Virginia, for cultivating this tree, as communicated by Mr. Geddes.

"Mr. Bayley has now (1814) sixty three thousand trees, and a large distillery which is employed only one month in a year.

"His peach orchards are planted in rows from north to south, twenty feet apart, and in each row a tree is planted every ten feet. He has tried a tree at every twelve feet and prefers ten feet. The stem, from the ground to the limbs, is only two feet long, the trees being less exposed to injury by the winds; and in Mr. Bayley's opinion, the branches grow more upright, and he is enabled to plough closer to the tree than if the stems were longer.

"He has tried Mr. Coulter's method of having no stems. He puts stones in the ground any time between November and April, but prefers December; and cuts out dead and broken limbs, without any other pruning.

"Ploughing and harrowing the orchards is commenced when the spring frost is over; and about this Mr. Bayley is very particular. He plowed one year, a part in March; after which came frost, and every peach dropped off the tree in the part ploughed; while those ploughed after the frost, yielded a fine crop. At present, he ploughs in the latter part of April; again in May; harrows in June; and again in July.

"The plough is a very light one, drawn by one Horse or Mule, only scarifying the surface, to keep down the grass and weeds, and not cutting the roots of the peach tree, which run very shallow.

"His harrow is nothing but three hoes, nine inches wide, each placed under a triangular harrow frame; their situation and shape thus, making together a breadth of twenty-seven inches.



[Ploughing! See Mr. Hale's letter, &c. experience!]

"Another piece of labor has to be performed in this warm climate, which serves likewise to keep down the weeds and grass under the trees. An insect resembling greatly in appearance the botfly [!] that teases our Horses, pierces the bark of the tree, a little below the surface of the earth, and there deposits, in June and July, its eggs; out of which are hatched a red worm [!], half an inch long and of the thickness of a coarse knittingneedle. These worms injure the trees much, and often kill them, by girdling them quite round, just under the surface of the soil.

"To prevent these winged insects from operating on the softened bark, near the surface, a hill of earth about a foot high is raised round each tree, about the 1st of June; and taken away about the 1st of September. These insects either find the bark too hard and dry to pierce, or the taking away the earth leaves the eggs uncovered and they perish. The fact is, after a ten years trial, Mr. Bayley has found his trees thus completely preserved against the worms.

"The age of a peach orchard, Mr. Bayley estimates at twenty years [There could have been no "yellows" in that region in 1814!]. He has seen them much older; but thinks more profit is to be had, by replanting at the end of twenty years. A tree is nearly in perfection the sixth year; when it will yield annually at the rate of fifteen gallons of fourth-proof brandy, for every hundred trees. The price of this liquor, before the War [of 1812], was one dollar fifty cents, and now two dollars per gallon.

"When the season of gathering peaches commences, a number of Hands are hired, chiefly

Boys, at the price of one-third of a dollar per day. The Hands gather peaches at the rate of one-hundred gallons of peach-juice per day, each, which yields seven gallons of fourth-proof brandy.

"A Man and a Horse bruise, and puts into tubs for fermentation, enough per day for one-thousand gallons of juice. The peaches are bruised in a mill, similar to the stone bark mills; but the wheel is a wooden one, four feet in diameter and nine inches thick, runing in a circular trough eighteen inches wide, and twelve inches deep. The peach stones are not broken, nor any use made of the kernal.

"After complete fermentation, which often takes eight days, the juice is drawn through a tap near the bottom, and distilled as cider is. When no more juice will run, the pomace is pressed to get out what remains.'

"Mr. Geddes observes that, notwithstanding the expense of the ploughings and harrowings, &c. the clear profits of the orchards of Mr. Bayley have frequently been upwards of twenty dollars an acre.

* * * *

"This culture seems more particularly adapted to the great track of mellow, level, sandy land which stretches along the Atlantic, in the Middle & Southern States, than for harder soils and hilly grounds; as the hardness of the soil would increase the expense of and the soil of hills would be subject to waste, by the heavy rains, when kept constantly under the plough." — pp. 285, 286, and 287. — Quoted from The Farmers Assistant. By Jno. Nicholson, Esq. of Herkimer Co. N.Y. Published by Benjamin Warner, Philadelphia and Richmond. 1820.

11

Yellows & Soil Poorly.

"I have [Peach] trees growing that were planted where trees having the yellows were taken out, - that have borne healthy fruit three years and show no signs of disease." James T. Taylor, Douglas, Michigan, Letter of March 16, 1888.

Peach acreage in Newcastle Co., Del.

"In 1870 there were very few if any peach trees nearer us than Mt. Pleasant on the Delaware R. R.; the mass of the orchards in this County was between Middletown & Smyrna. However, I think if you make an inquiry of either or all of the following gentlemen, they probably can give you the desired information - Gov. Benj. T. Biggs, Ex. Gov. J. P. Cochran, Nathaniel Williams, Middletown, Del.; David J. Cummings, Smyrna, Del. I feel sure that through the above named parties you can find the number of acres and trees that were in bearing about 1870 to 1887, as they were all members of the 'Peach Growers Association'." T. S. Dunlap, Delaware City, Del., Letter of March 19, 1888.

Peach acreage in New Castle & Kent, Del.

In a letter from Dover, Del, dated March 20, 1888, J. Alexander Fulton, says he is unable to tell you approximately how many trees were in New Castle Co, in 1870, but refers me to three sources of information:

1. U.S. census 1870
2. J. N. Mills, Supt. Del. R. R. Clayton, Del.
3. E. R. Cochran, Esq. Middletown, Del.

He does not know how many there were in 1887, but says: "My impression is that there is not more than twenty per cent as many now as in 1870."

"In regard to how many trees we now have growing in Kent I can only guess; but I think I am safe in saying we have 50,000 acres set. Of course many of them are not yet in bearing."

copy

Dover, Del., March 27, 1888.

Dear Sir:- In reply to your favor, would suppose we had in New Castle Co. in 1870 about 500,000 peach trees. The most of the orchards were in our County, between Duck Creek Hundred and Middletown, Smyrna being in Kent Co.

Our trees in New Castle Co. in 1887 would not number more than 250,000.

Very resp't

B. J. Biggs.

To E. T. Smith, Esq.

[Gov. of Delaware]

copy

Cecilton, Md., Feb. 23, 1888.

E. F. Smith, Esq.

Dear Sir:- Yours of the 18th received. Cecil County is divided into nine election districts, beginning in the South on the Sassafras river and running towards the Penn. line and thence westward to the Susquehanna.

This the first district has about a half million peach trees. Scarcely a farm that has not an orchard. The second, Chesapeake, district has perhaps half as many and the third, Elkton, a few about Iron Hill. The remainder of the county has scarcely any, none for market.

The first peach orchard of which I have any knowledge was planted quite near me on the Cassiday farm, in 1836. I have been engaged in growing peaches since 1855. During that time there has been some "yellows". As to its cause or cure I know nothing. A few years since it began in the orchard of my neighbor, Mr. Hurlock; the next spring [1884*] it crossed the road to one of mine and spread like fire from row to row, so that I cut it down in the Summer. How many acres? 7. This is my only experience with it. Some years ago nearly every tree sent out one spring from a certain nursery was affected by it, since then all, I think, have been healthy. If possible trace this a little closer.

At times I have thought that the yellows and starvation were closely allied. I do know that my best results have been when I used the most fresh stable manure and bone and potash. &c.

I will gladly answer any question on this subject as all here are more or less interested in it.

It does not relate to your subject but perhaps I had best say that while I think stable manure good for peach trees, I do not for the pear.

I am, very truly yours.

George Biddle,
Cecilton, Cecil Co. Md.

[V. P. for Cecil Co. of Peninsula Hort. Society]

* Mr. Biddle's own statement in reply to my questions as to year.

A. B.

Copy

[Middletown, Delaware]

Cochran Grange, March 29, 1888.

E. T. Smith, Esq.

Dear Sir:- Your favor of the 24th instant is at hand - contents noted. I am entirely at a loss to give you any information in regard to the subject matter contained therein. This county contained a great many [peach] trees in 1870, but to approximate the number would be very difficult to do. In 1887 the acreage was very small. I can only speak for myself in both years, - in the former I had over eight thousand trees, the latter none. Mine were not all destroyed by yellows, but partly from old age. I thought I saw the trouble coming, and quit planting, and all my orchards ran out. Last year the disease appeared among the young trees, from two to four years, with terrible effect, and I fear this year will prove fatal to many young orchards. You have suggested many cures for the evil, but, with all the fancy ideas held out, I would not permit any one to plant on my land and raise free of cost and give me the trees at three years old. Such is my confidence in peach growing in New Castle County.

Yours truly,

John P. Cochran.

[Ex Gov. of Delaware]

copy/

New Castle, Delaware,
March 31, 1888.

Erwin F. Smith,

Dear Sir:- In reply to yours of March 17 last - I would say, after consultation with E. R. Cochran, we put the number of [Peach] trees in New Castle Co, in 1870 at one million trees of all ages. Now, or in 1887 - about 600,000 trees. In 1875 - there were probably 1,750,000 [Peach] trees in New Castle County, Del.

* * * *

Very truly yours,
Jno. J. Black.

copy/ 12

South Haven, Mich. March 26, 1888.

Erwin F. Smith

Dear Sir:- I am in receipt of your favor of 24th instant. I have little personal experience bearing upon the question of soil starvation as a cause of yellows, and I have never planted a tree in place of one diseased; but this has been done to a considerable extent in orchards here, and I have not heard of disease traceable to this cause. I will try to supply you with evidence such as you desire, and will see that the cases are well-defined and authenticated.

Very truly yours,
T. T. Lyon.

[See next page]

cxx 9

South Haven, Michigan,
April 2nd, 1888.

T. T. Lyon,

Dear Sir:-

I have taken up peach trees that had the yellows, and re-set in the same places, and have picked peaches from said trees two years and they are perfectly healthy yet.

D. C. Leisenring.

In a letter of March 16, 1888, Rev. J. F. Taylor says:
"The Perrotet orchard - once owned by B. F. Powers - I am not acquainted with. Think it is now owned by Wm. Dorning, P.O., Gaylord, Alleghan Co.
"I think L. H. Howard - Gaylord P.O., could give you the condition of the Perrotet trees at the present time".
I wrote to Mr. Howard & received the following:

copy [see p. 212]

Gaylord [Mich.], April 1, 1888.

Dear Sir:-
Yours of the 24th of March duly received. In reply will try & give you the desired information as I have lived near the orchard and known its history since 1871.
First, the soil is a gravelly loam and was heavily fertilized with refuse from the tannery. The trees grew very large and the quality of the fruit was superior to anything I ever tasted. The trees grew very tall and what fruit and foliage there was [I was] on the tops of the trees, and I think the life of the orchard was shortened by being set too close [The trees were 16 ft. apart].
The trees were grubbed out by Mr. Dorning two years ago; and the year previous I think [1885] the commissioners marked 5 or 6 as having the yellows. Previous to that time I think there had been no appearance of the disease. I think the orchard gave out as much for want of room to grow as anything, for the trees on the sides of the orchard seemed to hold out best.
The ground has been reset to peach trees - the same year the old trees were removed [1886]. It was filled in again last season, yet many are missing. I think unfavorable seasons the cause for what trees lived grew well.
I cut down peach trees on my place over 30 years old joining this orchard. They were set around my apple orchard and were crowded out by them.
I have had no yellows in my orchards for the last 6 years. I think I have not lost in all to exceed ten trees of the yellows.

Truely yours,
L. H. Howard.

Copy

Odessa, Del., April 3, 1888.

Erwin F. Smith Esq.

Dear Sir:- In reply to yours received yesterday,- what is known as the peach district of this, New Castle Co., is the lower section extending along and south of the Del. & Chesapeake canal embracing about one-third of the area of the county. In fruits of this section or district peaches were grown for market as early as 1840, the acreage gradually extending until the maximum was reached in 1875, since when it has steadily decreased. There is no data certain data to determine the number of bearing trees for any given year, but

1. Judging from and estimating the shipments made in different seasons, & taking the average crop yield for those years, I would say the highest number was 1,000,000 bearing trees in the section indicated [in 1870], and as the usual "set" is 100 trees per acre, it would give 10,000 as the number of acres in bearing trees.

2. In 1887 this estimated number had decreased to less than one-third the maximum number of trees in bearing for reasons, in part, stated in answer to question 4.

3. In this section or neighborhood of which Odessa is the center the cultivation of peaches on an extended scale commenced in about 1852, and in the subsequent few years probably not less than 100,000 trees were planted on and near the navigable streams leading into the Delaware Bay. In 1857 all orchards in this section showed more or less indications of disease, the trees being generally short-lived, producing premature fruit, and showing unmistakable symptoms of the yellows. The above has reference to orchards planted previous to 1857. The trees planted in and after 1858 being generally healthy, long-lived, and comparatively free from disease. But I have never known an orchard in this section entirely exempt from disease since 1856.

4. Much depends on the nursery stock, the location and adaptability of the ground, the manner & mode of cultivation, but in my judgement more on the seasons and weather conditions.

In this latitude the peach buds during the winter and before commencing to swell are considered out of danger live with the temperature at zero - at 10 degrees below zero they are all killed and the bearing wood more or less injured - at 14 degrees below zero the bearing wood under the bark presents a discolored sickly appearance, much the same as the wood from a diseased or premature bearing tree [this is not constant]. The extent to which

they are injured by the low temperature depends much on location, soil, age, vitality, and other and unknown causes. In the instances referred to in answer to question 3, the thermometer in Jan. 1856 marked 14 degrees below Zero – nearly all the old orchards were killed, notably in the vicinity of Delaware City, and the younger ones rendered sickly & short-lived. Though the peach buds have on several occasions been all winter killed since 1856, the cold was not sufficiently severe to seriously affect the bearing wood until Jan. 1881 when the temperature again fell to 14 degrees below Zero with similar or rather increased marked results, as the trees were generally older and less vigorous than were the orchards in 1856 [Theory built up on an insufficient basis.]. In addition to the above cause & the disease and consequent loss of orchards during the past few years, the weather conditions of the Summers have had marked effect on the health & vitality of the trees. Hot, wet, and humid weather, such as we have experienced the last three Summers, not only rots the fruit but materially injures the bearing wood. The custom here is to cut down the diseased tree or trim off the affected branches, the treatment depending on the nature and extent of the parts affected. I ask him whether any one has been able to cut it out. Also for temperature & rainfall records for 1885, 86 & 1887. –]

I do not wish to be understood as having assuming that under similar conditions of weather the trees would be as healthy and vigorous as the orchards were 20 years ago, or that the yellows in peach trees is not a disease apparently contagious; but the causes, I think, are frequently produced by surrounding influences, often local, and, in a degree at least, subject to control.

Though peach orchards have been grown in this vicinity for 40 years, and, as previously stated, at no time entirely exempt since 1856 entirely exempt from disease [yellows], yet they are still planting here, and the younger orchards planted since 1882 are looking remarkably well [*], and the failure last year having been caused by wet and rot. [visit & examined in 1888]

Respectfully,
H. H. Appleton.

* Not true, Exd your orchards there in Aug. 1888, & found all of them over 5 yrs old badly died by "yellows".

Odessa, April 6, 1888.

cf

Erwin F. Smith, Esq.

Dear Sir;-

When I mailed communication of the 3rd instant I was not then aware that you were one of those engaged in making a scientific examination of the Peninsular orchards, and it has occurred to me that probably the answers given to queries received did not fully convey the information desired. If so, I will, as far as able, cheerfully give any additional information if you will designate what is wished.

It may not be inappropriate, however, to here add that there is, especially in the lower districts of the Peninsula, an erroneous impression as to the cause of the rapid decrease in the number of bearing orchards in this section since 1875. While it is true for reasons stated, as for others, that trees are not now as healthy and long-lived as formerly, the low prices for fruit then prevailing induced many growers to regard the business as overdone, and in consequence many good [?] orchards were taken out, others sown in grasses, which, for want of cultivation, soon ceased bearing and died out.

As stated in former letter much depends on location and soil. There are sections in this district where orchards never did well [where are they? Find out], the trees soon showing indications of disease and decline, while in others they have been grown continuously and successfully for 30 years [where are they?]. The experience of Messrs Reybold and others in the neighborhood of Del. City is often cited as an evidence that when orchards once fail they cannot again be successfully raised; and yet along the line of the Sassafras river in Md. there were bearing orchards of the same time [no. 10 yrs later] and age as the Del. City district previous to 1856 - and along that river are now located some of the best Maryland orchards [Now full of yellows - See my Field Notes for Aug. 1887]. The same is also true of parts of New Jersey that were in bearing at the period above named.

Our friend D. J. Cummins of Smyrna has a farm in this county situated on the Del. Bay on which orchards have been continuously grown since 1852, the same ground now in bearing trees

while other sections only a few miles removed have been out for years. The same is true of other soils & other localities in this county.

Success or failure in raising orchards therefore often depends on causes entirely local. It sometimes happens that two orchards from the same nursery, planted in the same neighborhood, at the same time, differ widely in results - the one being ~~totally healthy~~ comparatively healthy, long-lived & vigorous; the other sickly, diseased and premature - much of this is doubtless owing to different treatment and cultivation, but in many instances no sufficient reason can be assigned.

Respectfully, H. H. Appleton.

Question.

"In your experience have you ever succeeded in growing healthy peaches from trees set in the place of those dug out on account of unmistakable "yellows" i.e. set in place of trees which bore the premature, red-spotted fruit, or the stunted wiry branches, or both? If you have done so, when was it, and under what circumstances, and how long did the trees remain healthy?"

To this question sent out March 29 April 9. 1888 at later dates I have received the following replies:

col X 1 Fennville, Mich.] April 11, 1888.

[See p. 338 for additional information]

Dear Sir:

I have done so successfully. I planted an orchard on new ground, and out of that orchard one year I cut out twenty trees, adjoining, all of which had unmistakable yellows — which showed spotted fruit and wiry fungus growth. The trees planted in the places of those taken out have borne nothing but the best of fruit, showing no signs of yellows, and are still bearing on "Forest Fruit Farm"

* * *

Yours respectfully,
J. P. Wade.

col X 2 South Haven [Mich.], April 12, 1888.

Erwin F. Smith,
Ann Arbor, Michigan.

Dear Sir: Yours of the 9th is duly received and contents noted, and am very glad to impart such knowledge as I have which is limited. Perhaps to answer your question by simply saying, "Yes, they could", would not be as satisfactory, as to give you some brief examples.

I came into this country in 1852 when it was one vast wilderness. After the two first years having some improvement & knowing [that] our neighbors south at St. Joseph were raising peaches [we] thought we would try, and up to this date have raised peaches; have set 5 different orchards at various times on my farms and in the three first never saw any yellows. From 1875 have had a few cases of the yellows, but with

the ox and spade soon cured them. Then the question arose - Can we set trees in the place where those with the yellows had been taken out? The question was discussed very thoroughly in our Pomological meetings. By some it was thought to be dangerous, but the experiment was made & found successful; and for the last 7 or 8 years we have taken out the affected tree and the spring following have set in the same place - and have raised as fine peaches as we ever raised, free from any blight.

* * * *

Hoping this explanation will be satisfactory, I remain truly yours S. G. Sheffer.

Copy 3

Fennville, [Mich.], April 11, 1888.

Erwin F. Smith,
Ann Arbor,

Dear Sir: - We have no trouble in making trees grow in the place where we have taken out trees that had the yellows. I have an Early Crawford tree that I set in the place of one that had the yellows seven years ago, and it has borne fruit for the last four years, and shows no signs of the disease yet. Last season I picked 3 bask. [bush.?] from it of nice marketable fruit, and it bids fair to have on a good crop the present year. As far as my experience goes a new tree will grow just as well where you take out a tree that [I has] the yellows as it would if the tree had been in the best of health. You can't set a tree in an orchard of old trees & have it do as well as it would if the trees were all young, - as the old trees shade the ground with their wide-spreading tops, keeping off the rain & dew, and with their long roots sap the ground of the nourishment that the young tree needs to make it grow. I think the young tree starves to death. Two years ago I put in new trees in place of those taken out on account of the yellows. I gave the ground a liberal dressing of leached ashes, and you never saw finer looking trees than these are at the present time - full of fruit buds and capable of holding from one to two bask. of peaches. * * *

Yours truly W. H. McCormick

copy 4 The first case of yellows was in our orchard in 1872 *. But I think it was discovered in Rossiter Hoffin's orchard and perhaps one or two other places a year or two earlier. My attention was first particularly directed to it in 1872.

I have practiced setting trees in the places where they have been cut out on a/c of yellows, — some of them badly affected. Have trees in such situations now several years bearing. Several of our neighbors likewise. The main thing is to watch vigilantly — cut out promptly — and without mercy!!! Stamp out the disease and guard against infection.

Very truly yours.
A. S. Dyckman,
[South Haven, Mich.]

To Erwin F. Smith,
Stoh University
Mich.

P.S. Some of our best cultivators have large bearing trees in place of orchards destroyed by yellows. But they are thorough men. Our careless men have gone out of the business!

* A.S. Dyckman is the largest peach grower at So. Haven. He may be mistaken as to the year 1872. In March 1873 he asserted that yellows had not yet been found in his orchards — Mich. Pom. Report. 1873. Ask him to explain. His early statement may be safer than his memory.

copy 3

Gaugus, Michigan, April 12, 1888,

Prof. Erwin Smith,
Ann Arbor, Mich.

Sir; In reply to your letter concerning the "yellows" I desire to say that last season was the first time the yellows ever appeared on my place. I had a few cases in my old orchard last season. I am satisfied however that as healthy trees may be grown where diseased trees are taken out as could be grown on the same ground in the place where healthy trees of the same age, had been grown. Provided there is no part of the diseased tree left growing.

INTENTIONAL SECOND EXPOSURE

No one here, so far as I know, hesitates about planting new trees in the places from which diseased trees have been taken, unless it might be for the reason that the ground had become exhausted.

Hon. D. W. Wiley, of Douglas, Michigan, planted 5 trees in the places from which as many diseased trees were taken 12 or 15 years ago, and these five trees are still living and bearing, as well as if no diseased trees had ever occupied the ground.

Capt. Robert Reid, of Douglas, Mich., Rev. A. C. Merritt, of South Haven, and hundreds of others have thousands of trees growing and bearing well on land that was once occupied by trees that had the "yellows"

Yours truly,
A. Hamilton.

[Mr. H. is a peach grower & nurseryman of experience]

Copy 6.

Gaines, Michigan,
April 14, 1888.

Erwin F. Smith,

Dear Sir:— Yours received, in reply would Say I have succeeded in growing healthy peaches on trees set in place of trees removed which showed the first stages of the yellows, namely the premature ripening and spotted appearance of fruit. My first experience with yellows was 8 years ago. I had one tree which unmistakably had yellows. I cut it down as soon as discovered, which was in August and late in the fall pulled out the stump and removed both stump & branches, and the following spring set another tree in the same place, which commenced bearing the third year & has borne a crop every year since, and still remains healthy. I have had from one to a dozen trees diseased with "yellows" every year since, and have continued the practice as stated above, many of the trees bearing now. Have never yet had a tree show yellows when set in the place of one removed.

I always chop down as soon as the first symptoms appear — seldom have one showing the wiry growth. Have never used any preventative; always give thorough cultivation through the first part of the season until about the 1st. of August.

Your truly, A. W. Fisher
Gaines, Orleans Co.,
Mich.

* * * *

[Continued on p. 332]

See Letter File. letter transmitting for this.

Delaware.

Orchards and Value of Products.

U.S. Census of 1880 — year 1879.

Peaches.

County	Acres	Trees	Bushels	Dollars
The State.	44,456	4,069,653	1,361,343	846,692
Kent	19,879	1,837,211	813,965	494,520
New Castle	11,600	1,002,308	141,135	109,040
Sussex	12,977	1,230,134	406243	243,132

Unpublished data from U.S. Census of 1880.

copy

Manalapan, Monmouth Co., N. J. April 10, 1888.

Erwin F. Smith Esq. Ann Arbor, Michigan

Dear Sir: Your favor of 3/31 came duly to hand for which please accept thanks. There are a good many peaches grown in this County, at the present time, and the orchards are increasing in number. To say that the disease (yellows) has disappeared is not true; but perhaps no crop pays the grower better than peaches, notwithstanding an occasional orchard is not successful. Perhaps this is as good and definite an answer as I could give to question No. 1.

2. The oldest orchards [in vicinity of Manalapan] are about ten years and about this age they usually cease to be profitable. There may be exceptions, according to care in thinning fruit, trimming trees, and fertilization.

3. As above stated, [yellows] shows itself to a limited extent in some orchards, but not enough to seriously affect the crop or longevity of the orchard as a whole[?].

4. There are a good many orchards planted each year, and the number seems to be increasing.

5. This is answered in Section 3, but in addition would say that I have been more or less familiar with peach orcharding for 30 years and I do not see very much more of the disease now in bearing orchards than I did in my younger days. Some orchards or some locations, now as then, seem to suffer more than others; and then, while cultivation and fertilization of the soil will not overcome the disease, they greatly aid in keeping the tree vigorous so as, I believe, to resist the attack. The symptoms you name are undoubtedly signs of the disease - and my notion is the disease is caused or induced by climatic changes, as I am creditably informed that the disease is not known South of a certain parallel of latitude. This latter I have on such authority as P. J. Berckmans, of Augusta, Ga. On Oct 9, 1886 we had a freeze that froze the trees while in full growth the ground at the time being very dry. The result was that many trees 2 to 4 years old were killed outright and others with large limbs through the tree. Some of these trees fruited last year with much discolored fruit, and I look for more disease in these orchards than older ones not so much affected.

INTENTIONAL SECOND EXPOSURE

This frost reached as far south, I think, as Dover Del., and perhaps farther. [The first frost of any severity in 1886 in Kent Co. Del., was Oct. 17], and the unusual quantity of fruit that showed the presence of the disease last year might be attributed to it. I saw this discoloration on fruit from trees 15 years old that were always healthy before. This was near Smyrna, Del. [In whose orchard?]

The one thing peach growers need is a remedy for the disease. The cause & cure must come from scientific men. I hope you will be instrumental in furnishing this information. You might inquire further from.

E. Beekman, Middletown, N.J.
(see p. 298) D. S. Wyckoff, Freehold, N.J.

Very truly yours,
David Baird.
[Nurseryman]

copy 7

South Haven, Mich. April 17 1888.

Mr. Erwin F. Smith,

Dear Sir:- Yours of yesterday rcd to-day. In answer to your first question I can say, yes, most emphatically with this qualification, not "or starved wiry branches". The trees that I have cut out with yellows have nearly always been thrifty & vigorous, showing the disease only in the fruit & sometimes only in two or three peaches, while all the rest would be healthy, and often only one or two limbs would be visibly affected. Thorough cultivation has been my practice, and also to take out a tree as soon as it shows the disease. I have bought & set a few trees that never showed anything but the "starved wiry" fungus growth [Farmers use the term "fungus" not as botanists]. But took them out and burned them as soon as discovered. Had I carried over yellows

INTENTIONAL SECOND EXPOSURE

tree to bear the second season, doubtless I could say, yes, to the last clause of your first question.

Question 2. When was it?

I first discovered unmistakable yellows, in the fruit of one limb of one tree, in my peach orchard some fifteen years ago. I dug the tree out and burned it, before the crop matured. I do not remember as I reach the following spring in this particular case but did very soon thereafter. Have had yellows ever since reaching as high as 75 bearing trees in a season, and it has been my practice to reach the following spring - all these years.

Question 3. Under what circumstances?

I had read of the disease. The fruit was getting color weeks ahead of the rest of the tree, or others. I believed it to be the yellows - invited my friends to see it, the first of whom unhesitatingly denied its being the yellows, but could only say "it was getting prematurely ripe for some reason". He was as inexperienced as myself and that I was right my subsequent experience proved. A few trees followed the same fate the next year, and for several years I took out and re-set from 30, 40, 50, to 75 & then ran down to 50, 40, 30, 10, 1, 1, and last fall, with 4000 trees set & 2,000 bearing, I lost 6 trees. You will notice that two falls I had but one case each. I cannot give the exact number reset, but I fill my vacancies every Spring, and the most of these trees are in bearing - and many of them have been until they are past their prime.

5th Question How long did these trees remain healthy?

Am not certain that I have lost a tree with yellows the second time in the same place. Since the orchard reached a large growth filling vacancies has been, I suppose, at a great disadvantage to the newly set trees - but evidently the fact that yellows trees preceded them has nothing

to do with it. I apply ashes and a little ma-
-nure to the soil where the old tree grew, for the
sustenance of the new; and for years, and last fall,
the tree occupying the ground where I took my
first tree with yellows was heavily laden with heal-
-thy peaches — and that is only one among many
like it.

6th Question [What reason have you for thinking that
the trees dug out were diseased with yellows?]

I am hardly able to write this poor letter this
morning - in justice to myself; and need only
say that from observation and experience
I know the yellows at sight as readily as I
do the most familiar varieties of fruit or the
difference in different species of trees. The
best written description of the yellows is
as nothing (in conveying an idea or
knowledge of it to a person who has never
seen it) in comparison with the cer-
-tainty of knowledge and ability to detect
it (when there are visible signs) that comes
to some who have a practiced eye by
long & interested familiarity with it.

Yours truly,
A. C. Merritt.

Copy 8

Douglas, Michigan,
April 18, 1888.

Erwin F. Smith,
Ann Arbor, Michigan

Dear Sir:- Your letter of the 9th inst.
and one of the 16th are before me and I
now hasten to reply to your questions as to
my experience in growing healthy peaches
from trees set in the place of trees
taken out on account of unmistakable
yellows.

My own experience and that of some
of my neighbors has I think fully estab-
-lished the fact, with as at least that

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healthy fruit has been and can be grown upon trees planted in the place where diseased trees with yellows have been removed.

My first experience in this direction occurred the Summer of 1874 when in an orchard of some 4,000 trees, I discovered six trees of the Early Crawford variety, all heavily laden with fruit and standing quite near to each other, showing unmistakable signs of yellows— a part of the fruit on each of those trees was spotted with red spots, the red streaks extending from the surface to the pits. I had those trees dug out at once and burned, and the following Spring planted trees in the same places. These trees came into bearing the third and fourth year from planting and produced fine healthy peaches and continued in so doing during the life of the trees.

At the present time I have one tree that bore its first fruit last season, being four years old this Spring from setting. The fruit was perfectly healthy. This tree was set in the place of one taken out that had the wiry growth of wood, and had yellows and no mistake.

From my own experience, and with quite extensive observations as commissioner of yellows for four years, I am strongly inclined to the belief that where trees having yellows are promptly removed and destroyed there need be but little cause for alarm. But what we shall be able to furnish healthy

INTENTIONAL SECOND EXPOSURE

and fine peaches for many years yet.

Truly yours,
H. W. Wiley.

[P.S.] In some of our Lake shore towns there seems to be a neglect in taking out and destroying diseased trees. In these local-ities the disease is on the increase and from such neglect we may in time loose all our trees.

9 [See p. 321]

cop 10

Douglas, [Mich.], April 18, 1888.

Mr. Smith,

Dear Sir:- Yours recind this evening. In reply to your first question [See p. 327], Yes, For three years I have been gathering peaches from those trees. I have dug out above the spotted fruit and had the wiry growth.

[The additional questions were as follows:- 2. When was it? 3. Under what circumstances? 4. How many trees were thus reached? 5. How long did these trees remain healthy? 6. What reason have you for thinking that the trees dug out were diseased with yellows?]

2d. In 1878- Ten years ago.
3d. Condemned by the yellows Commissioner.
4th. Three hundred.
5th. Six years [This may refer to age of original orchard]. Those reached are healthy to-day.
6th. Because the fruit was spotted, insipid, and some of the trees had wiry growth; and were condemned by the yellows commissioner. The three hundred trees

were taken out of an orchard of 2,000 trees.
I took an orchard of 500 trees which I reset two years ago and the trees are doing well.
[See p. 339]

Yours truly,
Robt Reid.

In answer to additional questions relative to his orchard J. P. Wade [See p. 327] replied by postal as follows:—

April 16/86.

Replying to yours of the 14th inst. The 20 trees were dug out in 1882 and young trees planted in same places 1883.
The forest timber was beech & maple. It had one crop only after clearing before the trees were planted.
The trees were 5 years old when the yellows were first discovered with the exception of one tree the year previous.

J. P. Wade.

11 [See p. 316]

12 [See p. 320]

After receiving Robt. Reid's letter of April 18, 1888 (see p. 337) I asked him the following questions to clear up some of his statements;

1. How long after you dug out the 300 yellows trees before you re-set? Was it in 1878?

2. When you re-set did you manure these trees or give them any other treatment very different from the rest of the orchard?

3. In the other orchard of 500 trees, destroyed by yellows, and reset two years ago, how long a time intervened between the digging out & the resetting i.e. What year did you dig them out & what re-set?

4. Have you used potash or any special fertilizer on the trees re-set two years ago in place of the 500?— So that this might possibly account for their healthy appearance?

Mr. Reid answered as follows:

Douglas, April 26/88.

Mr. Smith,

Dear Sir:— Yours is at hand. In answer to your first question — The next year, 1879.

2nd. Used no manure, but put air slaked lime on all my orchard. Have manured since. The soil is gravelly — wheat soil.

3d. Three years. Dug out the last in 1883. reset in 1886.

4th. Hoor used air slaked lime on them also.

I followed, as near as I could, the directions found in John Rutter's book on Peach Yellows. Book to be bought at West Chester. Pa., price $1.00

Yours respectfully,
Robt Reid.

INTENTIONAL SECOND EXPOSURE

Lewes, Del, April 13, 1888.

cop

Dear Sir:- [1] Peach planting has increased to a great extent since 1880.

[2] I should judge about 50,000 acres or more at the present time. [Question - No. of acres of peaches now set in Sussex?]

[3] The commercial orchards were planted about twenty five years ago or more. [Question: When were the first commercial orchards planted?]

[4] Orchards here come in bearing the fourth year.

[5] Peach growing is most extensively carried on in the North, East and Western parts [of] Sussex Co.]

[6] Peach yellows has never appeared here to the best of my knowledge.

Truly yours,
Harbeson Hickman.

[Mr. Hickman is one of the largest land owners in Sussex Co.]

To Erwin F. Smith, Ann Arbor, Mich.

cop

"Reed Place" near Frederica, Del;
4-16-1888.

Mr. E. F. Smith,
State University,
Ann Arbor, Michigan.

Dear Sir:- In reply to your favor of 10th. Peach trees for commercial purposes were first planted here on this farm "Reed Place" by my father John Reed about the fall of 1829. Other larger orchards were not common in this section until after 1860. Peaches have been raised in a large way on this farm for 59 years and we

never knew what the "yellows" was on this 342
farm until about 3 years ago, when we had
one tree in the outside row along the public
highway.

The yellows is now worse among my
neighbors than with me, and they have known
and never known it to be set in peach trees
before - sooner than on this farm - and in
orchards set out within 10 years.

The first tree I ever saw with yellows in
Kent County, Del., was near Camden about 10
years ago. The tree was left stand until it
died - the orchards around Wyoming, and
Especially in the vicinity of that tree are
badly affected, some orchards being entirely
destroyed.

My father was a great patron of the peach
and seemed to understand the peach need
as early as 1840. His theory and practice
was not to push the trees too much.

The "yellows" seems to be propagated under
three conditions: First, always where they have
been mostly cultivated, - as around Boston
New York, Philadelphia as early as 1780. Secondly
propagating from unhealthy seeds and buds.
Lastly, too much pushing of the trees by improper
manures and on rich lands with close
planting.

Of course, there are many theories and
I have mine - [illegible]

When the "yellows" has once been intro-
duced into a section by any or all of these
causes that the disease becomes epidemic -
goes in the air and is breathed into the
trees by the leaves and the sap thus poisoned.

Fortunately for me, we have had as yet only
about 350 trees out of 10,000 cultivated nearly
all the time for 59 years — as one orchard
was worn out we have set about the same
amount on another part of the farm

and thus kept up our fresh commerce or production.

But what trees I have had with "yellows" convince me that the cultivation, what I have used as fertilizers or what I have not used - in line of my experience - has had nothing to do with it in their individual cases. I of course may be wrong, but such are my honest impressions and experience in a life of 52 years of close study & observation of the source producer of my home & life comforts.

We have suffered as yet but slightly compared to others, from the "yellows", but we are surrounded and in great fear that our ancestral favorite is soon to go from us with this dreadful blight, if some means cannot be found to stay its deadly ravages.

Hoping that you may soon unravel this mystery of nature & be potent in staking off this nightmare to our prosperity, I am, Sir, with much respect at your service for anything I can do to assist you in your important labors in this regard.

John M. Reed.

P.S. If in Del. again call & see me.
J. M. R.

[Mr. Rigby, I know, told me Mr. Reed was one the oldest and best informed fruit growers in Delaware]

INTENTIONAL SECOND EXPOSURE

Copy in reply to yours of 13th inst.

Denton, Caroline Co., Md. Apr. 16, 1888.

Prof. E. F. Smith,
Ann Arbor, Mich.

Dear Sir:- Have for the last 20 years resided at Denton (Centrally located in Caroline Co.— County town), Maryland. I See p. 47. Tr. Penins. Hort. Soc. Dover 1888, where President Kerr says of "yellows": "For the past 20 years I have had no experience with the disease, but previous to that I was familiar with it in central Pennsylvania, and whatever a Pennsylvania Dutchman could think of or devise was tried to prevent or cure the malady. They tried everything in the way of cultivation, manuring and no manure, but no remedy was found."]

2nd. While in Pennsylvania resided in York, Cumberland, and Dauphin Co's— where the yellows were general [1867 and prior].

3rd. Do not know address of Mr. Chas. Booker [It is Milford, Del.]

4th. Harry A. Roe is a near neighbor on lands adjoining. He is a young man and has no practical or experimental knowledge of the disease at all. His remark [*] "We have no yellows in our neighborhood, but the disease is not far from us." [Tr. Peninsula Hort. Soc. Dover, 1888, p. 49x] was caused by the fact that Kent Co., Del., adjoins Caroline, Md., and at the time our meeting

* "The P.G. Dr. Roe is Denton, Md, and he knows nothing about the yellows." — Wesley Webb, Former Letter of April 17, 1888.

was held There was much anxiety manifested by the peach growers of Kent Co., Del. I am safely within bounds when I state that there are not half a dozen men in this county who would know the yellows from any other enfeeblement that would affect the foliage of the tree.

The aphis is sometimes very abundant here, preying on both roots and young under growth, and when it gets a ~~foothold~~ fair hold on the roots, the tree sickens to an extent that produces pale, weak, or yellow foliage - Borers too industriously ply their vocation, producing results familiar to yourself or any other interested observer.

I have yet to see the first sick peach tree in this county, the affection of which I could diagnose as real Yellows; yet the indiscreet purchases by many of our citizens, during the last few (four?) years, I fear has laid the foundation for trouble. I am a nurseryman and it would place me in an apparently selfish light for me to urge our people not to buy trees from "Jersey", when my stock was exhausted. And we have young orchards now in this County that I feel sanguine will develop the disease.

In brief, at present, you can correctly state that the disease does not exist in this county.

I will take pleasure in furnishing any further information in

my possession that will in any way assist in unmistakably establishing the cause of the disease, or a remedy for it.

Very truly etc.
J. D. Kerr.

Seaford, Delaware,
April 23, 1886.

Copy

Mr. Erwin F. Smith,

Dear Sir:- In reply to yours of the 10th, I have to say that there is at least twice the acreage of peach orchard in Sussex Co. to-day, that there was in 1880, and the planting of new orchards continues with increased impetus.

The first orchards for commercial purposes were planted near Seaford about 1855. In fact I have the honor of having, when a school-boy, sold the first baskets of peaches for shipment beyond the borders of the State, at the Seaford depot the first year that the Dela. R. R. was open for traffic from this point. I received for them two dollars and a half per basket in gold, at the depot. The orchard from which these peaches were taken was a small family one, consisting of about one hundred trees of the then leading varieties, and finer fruit I have never seen. It was planted about the years 1847 or 48, on the farm on which I now reside, and lived to produce excellent fruit for nearly thirty years.

I have since taken such orchards that were in pretty fair condition at twenty five years. I have an orchard, now in a very vigorous state of health, loaded with blossoms, and from which I last year took magnificent fruit, that was planted in 1864.

The largest orchards in Sussex Co. are along the lines of the Dela. R. R. running along the western border of the County; and in the vicinity of Milford and Lincolan City, on the Eastern border.

Our orchards as yet, so far as I know, and so far as I have been able to ascertain by dilligent inquiry, are entirely free from "Yellows" or other diseases; but how long the cupidity of nurserymen will permit us to enjoy this immunity, I am not able to say; for in the great demand now existing for nursery stock, they are not at all careful whence their trees are taken.

Respectfully,
E. L. Martin
[Ex-Congressman]

In his book published at Harrisburg, Pa. in 1880, John Rutter says that "Yellows" was very prevalent at West Chester in the mid Summer of 1876. p. 12.

for Report

Soil Poverty & Peach Yellows.

I If "yellows" is due to soil-exhaustion the most convincing proof will be found in localities where the action of other presumptive causes, e.g. contagium, freezing, etc., have been reduced, naturally or artificially, to a minimum. Manifestly, it will not do to accept evidence on this point from sections of the country where several supposed causes are acting unrestrainedly at the same time, and any one of which may be the true cause. For this reason the whole Atlantic coast is ruled out, and also a large part of the northwest. In all this region either the ~~climate is~~ winters are severe; or the disease is not present; or it is allowed to spread without any general and systematic effort to check it.

The only localities really suitable for such an inquiry, are (1) those parts of the South where the disease has never appeared; and (2) the peach belt of Western Michigan, on the Lake shore, in the vicinity of South Haven, Van Buren Co., and in the townships of Casco, Saugatuck, Allegan Co, where the yellows loves is enforced.

#. (Discuss the character of the soil, the period it has been under cultivation, & the longevity of the orchards in S. Del. S. Md. in Va. & Southern O.)

The four townships named comprise the Michigan ~~region~~ the most important peach district in the State, the only one at all comparable to New Jersey or Delaware. By State law, supported in this region by a very strong public sentiment based on a nearly universal belief in the communicable nature of the disease, ~~all~~ peach trees affected by "yellows" are dug out and burned as soon as discovered. On the theory of spread by contagium the infective material, whatever it be, must presumably be kept at a minimum. If it is developed in the tree, it can never be very abundant for there are never very many diseased trees in existence at any one time. The proximity of Lake Michigan also serves to prevent injuries by freezing. Here then the influence of two supposed causes is reduced to a minimum, and the effect of soil exhaustion will, if anywhere, be freed from complications, and in condition to be estimated at its true value.

The fact that "yellows" still appears, year after year, in the region mentioned, in spite of law, & of the modifying influence of the Great Lake would seem, at first, to favor the theory of soil-exhaustion, but it

INTENTIONAL SECOND EXPOSURE

does not really. Some very stubborn facts stand in the way of any general acceptance of this theory. These are:

1. "Yellows" is much less prevalent where the law has been enforced. This phase of the question will be considered later at some length under — "Influence of Legislation"; and need only be mentioned here. Of the fact, I think there can be no doubt.

2. "Yellows" appears in this region on productive virgin land, i.e. on land cleared of the original forest within less than a decade, and never exhausted by cropping. This statement is so important, ~~if it is true~~, that I have been at great pains to verify it, by extensive correspondence, and later by a visit to the region. There seems to be no doubt about it. (Insert proofs in detail)

3. In this region it is the custom, and has been for ten or more years, to set peach trees in the place of those dug out on account of "yellows", and these re-sets are not more liable to the disease than other trees in the orchards. In fact four reliable peach growers, I now have a large body of testimony showing that trees set

in place of those unmistakably diseased by "yellows", have come to maturity and borne healthy fruit, and are now healthy. Such a state of affairs could not possibly exist, if soil exhaustion were not generally the cause of "yellows", or one of the necessary factors in its production. Granted this premise, it would seem that the theory of soil exhaustion must fall to the ground. I have therefore in every way tried to invalidate the evidence which I have accumulated but not being able to do so, I present it herewith in full. (Insert statements & proofs)

Copy

[Vineyard, Georgia]
8 May, 1888.

Mr. Erwin Smith
Ann Arbor, Mich.

Dear Sir:- Your letter was recived and I will comply with your requests as far as I can. Have mailed you limbs also spurs from the larger limbs of the diseased [Peach] tree. This peach tree is growing in an orchard of five year old trees, and all of them of very strong growth. The tops nearly meet while the trees are 20 ft. apart each way. It showed slight symptoms of the disease the latter part of last summer, and is now a fairly developed specimen of a tree with this disease; but later on the branches will have formed large rosettes of leaves. I notice also a tendency to form tufts of leaves along the larger branches (a few of which I send you) instead of the small wiry shoots as is seen in the north. This tree is standing opposite of where one was dug up last year, having the Southern form of yellows and only two trees (or 40 ft. distant) from the tree now attacked, the twigs of which I send you. I see photographs of specimens. I think it is yellows!]

At the regular meeting of the Middle Georgia Hort. Society I read your letter yesterday and among the many fruit growers present there was none who had seen trees with this disease bearing any fruit, but some of them were of the opinion that the disease was contagious as where one tree was affected others would commonly be found with the disease: I have set out young trees in the places where diseased trees had been removed and will watch the result. The

people here do not pay the close attention to fruit and trees they do in the north, and hence it is more difficult to obtain accurate information.

* * * *

[Mr. H. sends Exoascus on plum. Says it is also on peach, and adds that the trees die from this & very one from the disease supposed to be yellows] ?

? See later statement. Mix up his statements. Has some other disease in mind.

Yours very truly,

J. D. Husted.

[Fredonia, Ord.]
4 - 30 - 1885

Copy 1 3 HL

Prof. Mr E. F. Smith,
State University
Ann Arbor, Michigan

Dear Sir:-

Yours of 20th came duly by mail. * *

As you suggest we have, ever since we saw the effects of the first tree, dug and burnt as soon as we could "without mercy" every tree with this new phase of the yellows: namely, willowy, wiry or fungus growth whether in fruit or not.

Father's orchards I think were about 10,000 trees early in the thirties and remained so until 1858 when he sold out to me. I have now a remnant of a Crawford Late orchard [which] I set in the spring of 1859 still standing, and never saw a tree in it with the yellows until late last season & then but slightly. The term "yellows" seems applied to all peach sickness that causes abortion of its fruit, but the present alarming phase of the yellows is accompanied with an unnatural growth

and seems to have no visible cause; but is as mysterious as death in the young and thrifty, well cultivated or cared for of any species.

The orchards Father set out were productive and healthy in the Melacatoon varieties about twenty to thirty years; other varieties from ten to fifteen years. N. Wood, near Dover, set between 1840 and 1850 some trees for commerce, and in 1850 had quite an orchard; Also P. H. Cousley. Later our Governor [B. F. Bigelow?] set out about 100 acres of peach trees near Milford about 1850. Some of the trees were purchased of Father & some he raised & Father budded for him. These orchards did not receive the systematic care that Father's did and soon passed away but they never had the yellows as we know them.

The first tree I ever saw with the yellows was in Mr. Bancroft's orchard along the State road, as I was on my way to Dover, and I got out of my carriage and broke a sprig of the unnatural growth off & took it to the bank with me & called some attention to the fact. The orchard was then [1878?] about 4 years old from setting. I do not think the tree had any fruit on it at the time.

I knew B. P. Fisher, as a lawyer about Dover, but was not aware that he was engaged in growing peaches until after 1860, though he might have been.

Hoping that my brief answers may

from sufficient for your purpose. I am,
very truly yours,
John M. Reed.

P.S. I ought to say in addition, perhaps, that the disease of yellows is developing very fast, as we can find as many new trees with the disease this Spring as we had last fall after we destroyed them [i.e. as many as we found and destroyed last fall]. I believe our trees must succumb as the disease communicates in a mysterious way. Truly yours,
J. M. Reed

copy

Office of the Canadian Horticulturist
Grimsby, Ont. 24 Feb. 1888.

Mr. E. F. Smith,

Dear Sir:— In reply to your inquiries, I may state (1) That the law concerning the destruction of peach trees affected with the yellows has been enforced, especially for two or three years while the disease was at its worst. The inspectors visited orchards affected, & marked the trees that should be destroyed, and in most instances the owners, that knew of the dangerous nature of the disease were only too glad to follow our orders, & cooperate in the destruction of the affected trees.

In regard to Question No. 2, I may say that the disease has been checked ~~but not wholly eradicated~~ because affected orchards have been almost completely cut down and burned, but still we find young orchards showing it here and there, especially if planted where diseased trees have lately been removed; and as the inspectors have relaxed their exertions we may shortly be in as bad a state as ever.

Very much, however, depends upon the orchardists. I am of the opinion that more depends upon them than upon the inspectors, and a dissemination of the knowledge of the dangerous nature of the yellows, and the necessity of prompt extermination of trees affected, should accompany any legislation upon the subject.

(3) With regard to the first appearance of the yellows, I usually detect it first in the fruit, by early ripening, red color of flesh, and after the first year [by] decrease in size. Then I observe it in the young growth on the affected limbs, which is weakly & slender, while the diminutive leaves grow in little peculiar whorls.

I have found the Alexander, the Early Purple & the Old Mixon about the worst in my orchard;

though I noted some claim that yellows flush peaches are most subject to the disease.

In my own orchard, I always destroy diseased trees upon the first appearance of yellows.

I am, Sir,
Yours very truly,

L. Woolverton,
Secy Fruit Growers' Asso'n of Ontario.

copy

Grimsby, Ont., 28 May, 1888.

Mr. E. J. Smith,

Dear Sir:— By reference to p. 15, Vol. 1 of our journal [The Canadian Horticulturist] — a copy of which I send you — you will see (1) that the yellows first made its appearance along the Niagara river, in (2) about the year 1879 or *1878. (3) Hence bad news travels in Ontario about ten years. It is not merely prevalent about Grimsby but (4) along the Niagara river also.

I am, Sir, Faithfully yours,
L. Woolverton.

* wrong date. It was 1877 or earlier.

"The Parks Promenades & Gardens of Paris". By W. Robinson, F.L.S. London, John Murray, 1869.

Chapter XIX of this book — pp. 440–461 is devoted to "The peach gardens of Montreuil". I quote:—

"The finest supply of peaches for the Paris markets do not come, as perhaps many would suppose, from the sunny South or the sidney West, but from within a few miles of Paris where they have to be grown on walls furnished with good copings, and receive in every way careful protection and culture" — p. 440.

In 1868 about 250 cultivators had peach gardens at Montreuil — p. 440.

M. Chevallier & M. Lepere were two celebrated growers. — p. 442.

"Four or five hundred fruits are ever gathered from the best trees." — p. 445.

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By advice of Chas. W. Garfield I asked Elwood Graham concerning the existence of "yellows" in California, he having recently spent some time there, and received the following reply:-

Grand Rapids, Mich.
5, 28, 1888.

My dear Sir:- Yours of 26th is before me. In reply I will say that I never heard any complaints from any of the growers, neither have I discovered any [yellows] in that country. Have visited several orchards, one in Marysville; another in Sonoma Co., near Santa Rosa; several in Napa Valley; and one in the vicinity of Los Angeles.

Would recommend that you communicate with Professor Hilgarth, Oakland, Cal., for more accurate information.

Very respectfully yours,
Elwood Graham,

To Erwin F. Smith,
State University
Ann Arbor, Mich.

Peach Yellows in Canada

(See pp. 35-5 & 35-7)

In the Spring of 1878, A. M. Smith, a considerable fruit grower of Drummondville, Ontario, published in the Canadian Horticulturist, p. 15-16, - "A word of warning to peach growers of Ontario," from which I quote as follows:-

"Perhaps it is not generally known, but it is nevertheless a fact, that the disease so destructive to peach orchards, called the yellows, has made its appearance in our midst. Quite a number of orchards along the frontier, particularly in the vicinity of Drummondville and Stamford, have had affected trees in them the last season, & some in the great peach growing section of Grimsby. The symptoms of this disease are 1st an enfeebled vitality, the foliage looks sickly; and 2nd, the fruit ripens prematurely, sometimes two or three weeks before its usual season for maturing, and is usually high-colored, red and flecked or spotted, and is red around the stone. This occurring in young trees newly planted, has led many to think they had some new variety which was very early; but the flavor is universally insipid and watery, and the fruit nearly worthless. Hundreds of bushels of them were sold in Western New York last season [1877], their color recommended them, but no one would care to buy them a

second time".—p. 15

"I know there are some people who laugh at the idea of the yellows being here, and attribute the sickly condition of their trees to the cold winter of three or four years ago, and I do not doubt that the winter referred to injured the tree in some sections, and by enfeebling them, made them more susceptible to disease. But I saw this same disease on several trees in an orchard in Niagara Co., N.Y., the fall before the severe winter spoken of, (and I think some of it in Canada) and now that orchard is totally destroyed, and several others in its immediate vicinity are badly affected with it."—p. 16.

On p. 173 of the same volume (Nov. '78) L. Woolverton, M.d. of Grimsby in "Horticultural Gossip" writes as follows:—

"The Yellows.— It appears, as has been shown by a previous writer in these pages [see above], that we are in danger of an invasion from this plague of the peach orchards. Growers here, being unable to get sufficient quantities of home grown trees, have in time past imported largely from the States, without sufficient enquiry about their origin. In this way some trees have been imported

in which yellows was hereditary, and is now showing itself.

"The premature ripening of the fruit, the spotted skin, the deep color about the pit the appearance on the tree of adventitious shoots, slender, and bearing yellowish leaves, all prove conclusively that we have need to beware of danger, and speedily destroy every vestige of such trees from our orchards.

"At a recent meeting of the peach growers, in the Town Hall, Grimsby, the following resolution was moved by the writer, and carried: 'That whereas we are made aware of the presence of the yellows in one or two peach orchards about Grimsby, therefore Resolved, that we do most strongly advise every grower to carefully watch the first indications of its approach, and at once uproot every tree affected by it; and further to use the utmost caution in the selection of trees for planting.'"

On the same page is published a letter from Chas. Downing to A. M. Smith, dated "Newburgh, N. Y., Sept. 11, 1878", the first of which I quote:-

"Your favor at hand, & in reply say that you describe the Yellows very correctly

* * * * *

We have had the yellows here at intervals for over Sixty years, sometimes continuing for five or six years and then several years free from it."

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copy

Office of the
D. W. Beadle Nursery Co., Limited
Canvassers Depot. 331 & 33 Queen Street,
St. Catherines, Ont., Canada, June 1, 1888.

Erwin F. Smith, Esq.
Ann Arbor, Mich.

Dear Sir:- In reply to your letter of the 26th instant, I answer your inquiries as follows:-

1. The peach yellows first appeared in Ontario about twelve years ago.

2. [When? & where?] Almost simultaneously at Grimsby and Stamford; the first in the County of Lincoln and the second in Welland County.

3. I am not informed with regard to the number of places in which it is now present, but know that it is more or less prevalent in the different parts of what is known as the Niagara District, which comprises that part of Ontario lying between Lakes Erie and Ontario. There is a belt of land along the north shore of lake Erie, in the counties of Norfolk, Elgin, Kent and Essex, in which the peach is grown to some extent. I have not heard of the yellows being present in that part of the Province, & yet it might be without my being aware of the fact.

4. In Stamford it has destroyed many of the orchards entirely; in Grimsby, up to the present time, its ravages have not been so severe.

5. Cannot say that it is any less prevalent now than it has been.

6. The law has not been carefully en-

-forced; it has been better enforced in the Grimsby section than in any other part of the Niagara District. We are inclined to believe that it is owing to the attention paid to this law, that the disease has been less destructive in Grimsby than in Stamford.

7. Yes, it is present to some extent in the orchards near the Niagara river, but as yet has not destroyed any of them. I hear of one orchard, belonging to Dr. Watt, that is suffering from it considerably at the present time, more so than any of the other orchards in that neighborhood.

8. We have not had the disease in any of the peach trees, just in this neighborhood, to my knowledge, and I think it very doubtful that I shall be able to send you any samples of the disease from here, at least I hope it will not make its appearance. Should I have an opportunity, it will give me pleasure to favor you with samples of the diseased branches. I sincerely hope that your studies of this disease will result in the discovery of some easily applied and certain preventive or remedy.

If at any time you think that I can be of service to you, it will give me pleasure to render you any assistance in my power. Yours truly,

Dictated. D. W. Beadle

[Mr. B. is a prominent member of the Am. Hort. Soc. & was formerly Editor of the Canadian Horticulturist.]

Peach Yellows in Europe

"Peach trees look well in Italy but so far as my observations have extended are badly blighted by leaf curl in France. The fruit is just now [July 11] coming into market here – probably from regions to the south of Naples. Apricots are in the market constantly but thus far will not average up with Southern California apricots.

No peach yellows has been seen, & I have been constantly on the lookout for it on your account. ~~To my mind~~

To my mind peach curl does much more harm to the tree than people are in the habit of thinking. Does not gummosis of the peach follow this trouble?"

Extract from letter by Newton B. Pierce
Dated Naples, Italy, July 11, 1890.

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Yellows in Georgia.

copy

J. N. Harris & Son,
Druggists & Apothecaries,
No. 11 Hill Street,
Griffin, Ga, June 6, 1888.

Prof. E. F. Smith,
Ann Arbor, Michigan,

Dear Sir;- I send you by mail a specimen from a diseased peach tree. Would be glad to know what the disease is, and the remedy for it. There are a good many trees in this section now in this condition. They grow one year this way and the next they die. I dont know one that has ever recovered.

Your attention will greatly oblige our Horticultural Society.

Respectfully,
J. N. Harris

Rosette

[This specimen proved to be peach "yellows" of the tufted sort, identical with that received this year from J. D. Husted, Vineyard, Ga. See description in Field Book, Vol I. p. . I asked Mr. Harris some questions & requested additional specimens.]

369
copy

Griffin, Ga., June 13, 1888.

Prof. Erwin F. Smith
Ann Arbor, Michigan.

Dear Sir:- Yours of 9th to hand. At a meeting of the county Horticultural Society yesterday it was read and the following answers made to the questions:-

1. When did it first appear in the vicinity of Griffin? A. Six to ten years ago.

2. In how many orchards now present? A. In all.

3. About how many trees affected? A. Usually about one %,- but in a few orchards as much as 10 %.

4. Does it appear to be on the increase? A. yes.

5. I'd also asked whether such trees ever bore any premature, red spotted fruit, or if known whether any neighboring trees had been observed to bear such fruit.] In regard to fruit bearing the previous year- A. Have not noticed them particularly but think they seldom have any fruit the previous year. They never have any fruit the year this disease is on- & they are sure to die the next. Will try to watch more carefully this point. [Ask for facts in Aug or Sept.]

6. Peaches have been grown in this vicinity for 75 to 100 years- and there are several thousand acres with probably 150 000 trees in a radius of

7 or 8 miles.

It is beginning to look serious and may seriously damage the peach interest.

[7.] The soil is rolling, mostly dry hill-sides and flats between them; lands are usually rather thin & sandy or gravelly with clay sub-soil. Some places they are more fertile. As a rule, peach trees seem to do the best in this county on our good medium lands, in rich bottoms they do not do so well.

I have carefully packed more specimens & send by this mail. There has been a great change in the way of peach growing in this County in the last 30 or 40 years. Then there seemed to be no trouble about raising all the peaches you wanted, trees in almost any position did well. Planted in the corners of fences, or about the yard where they had no cultivation, they did well. In those days all the trees were seedlings and that may have had something to do with it. But not only peaches have greatly deteriorated but many other kinds of fruits. We are fast losing our morello cherries, blue & Damson plums, pears, quince, etc. There seems to be a blight in the atmosphere. The apple trees here for a few years past have had blight, very much like the pear blight. × ×

I would suggest that if these samples are not sufficient & satisfactory, you had best order a small infected tree, & have it taken up by the roots & sent by Express to the Department.

INTENTIONAL SECOND EXPOSURE

I would add that the common chestnut trees which used to flourish and bear abundantly have nearly all died in the last 20 or 30 years [possibly, too gloomy a picture based on few observations].

Very truly yours,
J. N. Harris.

[See photographs of these specimens & the description in Field Book Vol. 1 p.

Vineyard, Georgia,
18 June, 1888.

Prof. Erwin F. Smith,

Dear Sir; Please excuse my long delay in writing you as I am over 60 years of age, out of health, and overworked; but now hope for a few days rest and take the first chance to serve you. I send you by Express this a.m. via Jonesville a box of specimens from diseased peach trees. The lot in top of box, between the white cloth partitions is from a small tree just attacked this summer and is the only case I have found where the whole tree was not attacked at once with the disease. You will notice some of the branches are apparently healthy although the whole of the base of the tree appears

apricots.

The seconds and last specimens, under the second cloth division, is from a strong tree, six years old, and every part is diseased like the specimens I send you. This last tree, as well as the first, showed no symptoms of disease last summer that I noticed; - but from the fact that it shows so complete development of the disease now it is quite probable it escaped my notice last season. I am of the opinion the first symptoms of disease in this locality this year is not so manifest as in the north. I have found no person yet who has ever seen a tree with the disease in bearing, - and although several trees have fruited prematurely this season with fruit of large size, yet the flavor was good - a little more astringent than usual - but surface not high-colored and the flesh of the fruit was of the usual color in sound fruit. I will watch these trees through this season and next - and inform you of the final result.

A few other trees in my own orchard that suffered from curled leaf last spring are now making as strong growth as usual the leaves assume a yellowish look, not quite

normal. On these I will look after & report.

In my orchard of 6,000 trees from three to six years old I dug up last season three trees and this season have taken out two and have two more to dig out. Some old and neglected orchards are diseased still more. It is the opinion of several of the fruit growers that the disease is on the increase.

Peach trees grow here along the hedge rows and streams and the woodlands, and trees diseased are occasionally found in these places, hence it will be more difficult to eradicate the disease in such localities. Trees injured by borers and from winter and spring frosts should not be compounded with this disease, and many such trees are classed with the so-called "yellows".

* * * *

Yours respectfully,

J. D. Husted.

375 Yellows in California.

copy

June 1, 1888.

Prof. Erwin F. Smith.

Dear Sir:- Your letter dated may 26 - just at hand. As my husband is absent from home, will answer your questions. We both have the same amount of knowledge in this particular. We have never heard, or learned as a fact, that this disease peach yellows exists in [this] part of California, or ever has. We believe that dreaded disease has never come to this state, or surely we would have known it. There are some nurserymen in Los Angles City who have deciduous fruit trees shipped from Northern California. Can learn from them within a few days, if peach "yellows" has a hold in any part of this State. Will then write to you again.

Most respectfully,
Mrs. Irving White,
Sierra Madre,
California.

Peat contains practically no potash salts or phosphates – Sachs Physiology p. 262. Try growing peach trees in this. Will they contract "yellows"? The should according to the theory of Profs. Goessmann + Penhallow.

Sachs says that he bored holes in chlorotic trees and inserted funnels containing solutions of iron salts. The leaves became green in a few days. He used only several milligrams to each litre of water. Larger quantities poison. Try the sulphate on peach "yellows"!

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Copy

Hotel Glenwood
Southern California,
Riverside, June 20, 1888.

Prof. Smith,

Dear Sir:- Yours in regard to the Yellows received some time ago, and would have been answered more promptly but for sickness.

I have taken a good deal of pains & pains to get accurate information, & at last wrote to the Secy of State Board of Horticulture & just got a reply saying - The yellows is now and never has been in California.

I found one man who said he had seen a few trees with yellows. I had him describe it, and I know there was no yellows about it.

I have had a large experience with it at South Haven, Mich. and know it in all its stages; and I am truly glad you are giving it so much attention and study.

The only cure we have ever found for a tree with yellows is the grubbing axe.

I intend starting for the East to-morrow. Hope to reach home in about three weeks.

Calif. is truly a great State. The Greatest State in the Union.

Yours very truly,
Frank Linderman,
Riverside, Cal.

"Fruit-Blights & Diseases of Fruit-trees in New Zealand." (Interim Report on, By T. Kirk, F.L.S.). Presented to both Houses of the General Assembly by Command of His Excellency". From this report dated Sept. 7, 1885, presented to "The Hon. the Minister of Lands" and printed by George Didsbury, Govt. Printer, Wellington, N.Z. 1885, I quote as follows, pointing that Mr. Kirk's observations were confined to one year & made between Feb. 27 & Sept. 7. He says "my researches were practically restricted to the winter months."

"In the North Island the peach is everywhere decaying, but notwithstanding the depressing effect produced by the general dying out of the tree, I believe its vigour may be restored, and that the most important step in the way of restoration will be found indicated in my report." Introd. p. 2.

"The peach is liable to the attacks of numerous fungoid & insect enemies capable of effecting a serious diminution of the yield, and of exhausting the energies of the tree; but the total amount of injury caused by these unwelcome parasites during a long series of years would be but trifling when compared to the wholesale destruction that has overtaken the peach throughout the colony, and to which the name "peach blight" is generally applied. Thousands of acres of peach orchards and plantations in the North Island have been destroyed - the grand peach groves of the Maoris in the Hokianga, Kaipara, Waikato, Napier, and Wanganui Districts are things of the past, and the peach itself, once the most common fruit in the

the Colony, has now become the worst. It is no exaggeration to say that by the destruction of the peach, the value of the yearly food-supply of the colony has been diminished to the extent of several thousand pounds [£].

Curling in shoots to Puccinia [illegible]

"The first symptoms of peach-blight are usually exhibited after cold winds during the flowering season and before the full development of the leaves. The ovaries swell until the young fruits attain the size of a large pea, when a sudden arrest of growth takes place & they drop from the tree, in many cases not even a solitary fruit being left. The leaves also fall away without attaining their full development. At or before this time orange-coloured dots or pustules, doubtless of a fungoid nature, are formed upon the young twigs, and in some instances become confluent, ultimately leading to the disintegration of the bark, followed by an exudation of gum at the affected parts. The buds decay and become infested with thrip or other insects to a greater or less extent, the bark becomes shrivelled, & the affected shoot dies. As a general rule, the lowest branches are affected before the upper. Sometimes the tree is killed by the first attack, but usually, on the approach of autumn, new leaves are produced towards the tips of the young shoots. Although in many cases the new leaves are attacked by a fungus, the plant seems in a fair way for recovery, but in the following Spring the same sequence of incidents occurs, & sooner or later the tree dies.

"All the symptoms enumerated afford evidence that the constitution of the plant has become weakened; the vital processes are not properly performed, so that the plant

380 [J. J. Campbell, U.S. Consul, Auckland, New Zealand. ask him for information]

is not only unable to endure sudden changes of temperature, but is more liable to the attacks of fungi & insects, while it has less power to resist them.

"Among the facts which might be adduced in support of this view the following may be selected: (1) The simultaneous appearance of the decay in various parts of the colony, its rapid extension, & uniform results. (2) The similarity of results in other countries where the peach has received similar treatment. (3) Trees are destroyed at all periods of growth, from seedlings a few inches in height to trees in full bearing. (4) No external conditions can insure safety. Trees in sheltered positions suffer in the same manner as those fully exposed, although in some instances a sheltered position appears to retard the progress of exhaustion. On the other hand trees grown in sheltered positions are speedily exhausted when the shelter is removed. (5) If the demand upon the vital energies of an affected tree is reduced by removing a portion of the branches, the remaining branches usually exhibit an improved appearance, although of a temporary character. (6) If a tree be headed down when first seen to be affected, luxuriant and apparently healthy branches are speedily given off from the stump, but this also is only temporary; the old signs of weakness are usually exhibited the following spring, if not before.

"This weakening of the vital energies of the plant has been mainly effected by growing peaches on their own roots [?], and is to be seen in all countries where such a course has been followed. This is notably the case with the old Maori peach-groves, where one generation of trees after another has grown up from seed, and the same may be said of the cultivated trees in the orchards & gardens of the settlers. All the peach trees in the colony have been either raised from seed or have been worked on peach-stocks.*

"The first step in the work of renewal will be the selection of a suitable stock, & this we find in the muscle-plum, the stock invariably adopted by English nurserymen, who have to carry on the cultivation of the peach under far more unfavorable climatic conditions than prevail with us.

"It is advisable that the new stocks should be worked with buds taken from sound healthy trees. Trees of one year's growth from the buds could be purchased in England at £5 per one hundred, so that a few hundreds might easily be imported with a quantity of stocks. The dying trees might be cleared away at once, and a new stock made on a satisfactory basis.

"Trees worked on the muscle would be

* Mr. A.N. Urquhart, Esq., "of the Kaiaka," through whose hands this paper passed has the following footnote written apparently in 1886:-

"The past three dry, warm, summers have had a very beneficial effect on the foliage & fruit."

more hardy, better able to resist adverse influences, while their productive power would be increased rather than diminished. They would not be exempt from the occasional attacks of Curl and other fungi, nor from the numerous insect pests that infest the peach, and they would still be subject to sudden changes of temperature during the flowering season; but I do not hesitate to express my belief, whatever may yet be discovered with regard to the decay of the peach, that the adoption of the mussel-stock would once more allow of its profitable cultivation. Whatever new facts may be brought to light by a careful examination of the phenomena to be observed in the Spring [The author's observations began late in the fall], the adoption of a new stock lies at the base of all remedial measures.

"In an Auckland nursery I observed two healthy trees — the only trees absolutely healthy there; all the young stock, even the seedlings still in the seed-bed, being badly affected. The two healthy specimens were worked on mussel-stocks.

"Three varieties of peach are stated by some to be 'blight-proof': the Comet, Solway, and Early Rivers. This statement, however, must be received with some qualification, as I have seen the first and second in a dying state, and feel very doubtful about the third. Had the assertion been confirmed it might have been worth while to have double budded the mussel, using one of these varieties for the first working.

"Affected trees have been headed down and successfully worked with certain varieties of plums where the decay had not been too far advanced: time is required to prove the permanence of the scion. Should present expectations be realized we shall have one of the most striking instances of the influence of the scion upon the stock that has yet been brought forward [?] I am assured, however, that some varieties of plums do not succeed under such conditions.

"One instance in which the process of exhaustion appeared to be retarded by remedial measures came under my notice at the Bay of Islands. Mr. Goodhue, nurseryman of Taumarere, washes or syringes all his fruit trees during the winter season with a mixture of lime, sulphur, and carbolic acid in the following proportions: two gallons unslaked lime; 1 lb. sulphur; 1/4 lb. Calvert's carbolic acid powder. Sufficient water is put upon the lime to slake it; the sulphur & carbolic acid are added & thoroughly incorporated. It can either be used dry as a fine powder to dust affected trees, or by the addition of water can be made into a wash of any required consistency. Mr. Goodhue's fruit trees were remarkably free from insect pests; in every case the bark was bright & clean & the trees generally were in a vigorous state of growth. All his peaches, however, showed unmistakable evidence of gradual decay

although he informed me that they had greatly improved since he commenced his ~~treatment~~: the bark looked fresh & was less shriveled than usual, but the presence of dead shoots, with occasional gummy exudation told its own tale. Unquestionably the application of the wash had proved beneficial in destroying all insects, & thus lessening the strain upon the vital energies of the plant." Pp. 19 & 20

On ~~the same~~ page 20 Mr. Kirk says

"Curl or Blister (Taphria deformans)

This well-known pest is a troublesome enemy to the peach grower, and one of the first parasites to make its appearance on trees affected by peach blight."

"Peach aphis (Aphis amygdali)

Two or more species of aphis are found on the peach, but the form most commonly observed appears to be identical with the common peach aphis of Europe. The aphis frequently occurs on the peach in great abundance, and accelerates the process of exhaustion caused by peach blight of which it is not unfrequently said to be the cause."

Yellows in New Jersey.

"Observation leads to the belief that many cultivators do not nicely discriminate between the 'yellows' and the effect of the borer, and many times attribute the effects of the one to the other.

"Some of the surer indications of 'yellows' are the dying of the twigs, a rough, prickly look along the limbs, premature ripening of the fruit, which usually has a red flesh and a bitter taste." — Report of Mr. J. M. White upon Peaches & Peach trees in Morris Hunterdon, & Somerset Counties.'
6th Ann. Rep. N. J. Agric Exp. Sta, 1885, p. 192.

[His "prickly look" is possibly due to the growth of Cephrodium elongatum
Cornuteria]

Yellows in New Jersey.

"The experiments to show the effect of fertilizers upon the growth and productiveness of peach trees are successful, and are giving great encouragement to the cultivators as well as to the consumers of this luscious fruit. By the use of chemical fertilizers, especially of muriate of potash, the trees are now kept in healthy growth and in bearing condition

for many years, in the very fields where formerly, without the use of fertilizers the lives of the trees were limited to 'six or seven years. On unmanured soils the foliage of the trees turned yellow, great numbers of little suckers grew out on the branches, and the trees were said to have the 'yellows' and soon died. The good effect of fertilizers upon the failing trees is so marked that many cultivators of peach trees believe there is no such disease as the 'yellows', and that their early failure is simply due to lack of proper plant-food.

"The experiments lead, too, to the inquiry whether many of the cases of plant & tree failure are not due to want of proper & sufficient nutriment, rather than to peculiar diseases. It is certain that thorough & complete fertilization enables plants & trees to attain what, in other circumstances, they develop only a sickly life." — 7th Ann. Rep. N.J. Exp. Sta. 1886, p. 16.

387) Amount of P_2O_5 & K_2O in New Jersey Soil.

Dr. Peter Collier made a series of analyses of the "light sandy soils of Rio Grande, in Cape May Co." N.J. with the following results for cubic foot, weighing about 100 #.

	P_2O_5 %	K_2O %	Nitrogen %
Maximum	0.088	0.238	0.128
Minimum	0.024	0.061	0.045

"Calculated on a depth of nine inches, each acre contains 32,670 cu. ft., which weigh 3,267,000 pounds." ***

"These percentages, calculated upon the total weight of soil per acre, give the following as the absolute amounts of plant-food present:

	P_2O_5 per acre	K_2O per acre	Nitrogen per acre
Maximum	2,875 lbs	7,773 lbs.	4,182
Minimum	784 "	1,993 "	1,470

See 7th Ann. Rep. N.J. Agric Exp. St, 1886, p. 173

Muriate of Potash & Superphosphate of Lime for Yellows.

"In my experience if trees bear an excessively large crop they are liable to an unhealthy appearance; the leaves turn yellow; small reddish shoots start up from the large branches near the trunk, and the wood soon becomes of a dark brownish color. Whether these symptoms represent the specific disease called the 'yellows' or not, muriate of potash and superphosphate of lime, applied as soon as the crop is gathered, in the quantity of 400 to 500 pounds to the acre, with good cultivation and pruning, will prevent this premature decay, or arrest it if just commenced. If the fertilizer is withheld till the wood has become dark brown, its application may improve the appearance of the tree, but it will never become healthy and vigorous again." — Dr. Henry Race, of Pittstown, Hunterdon Co., N.J. in Rep. of N.J. State Agric Exp. Sta., 1886, p. 184.

Distance of trees in orchards,

In Somerset Co., N.J. it is the custom to plant peach trees ~~to~~ about 15 ft. apart each way. — Stephen C. Dayton, Basking Ridge, N.J., in Rep. of N.J. St. Agric. Exp. Sta., 1887, p. 104.

At Bridgeville, Sussex Co., Del. P. S. Cannon informs me that they are often planted 26 ft. apart. He considers this the best distance.

Dover, Del., Feb. 13, 1889

The peach and apricot in Northern India & western Tibet.

"Eine Tagreise weiter nach Nord-Osten [from Kachar or Katschár and Baspa Thal], befindet man sich in einer ungewöhnlichen Erweiterung des Thales [the valley of the Sutlej River, a tributary of the upper Indus], mit der üppigsten Fülle. *** Vor den Augen entfaltet sich ein Teppich schön bewässerter Felder, Gärten von Aprikosen- und Pfirsichbäumen, kleine Windflowerige Haine von Wallnussbäumen, oder dichte Cedergruppen mit einem durchschimmernden Hindoo- oder Buddhisten-Tempel in deren Mitte." – p. 85-1.

"Die Terrassen [about Chini in province of Bisahir] sind in der Regel mit Aprikosen-Bäumen bepflanzt, deren Frucht jedoch meist klein ist und Ende Juli reift. Das Fleisch der Frucht wird in frischem Zustande nur selten genossen, während man oft einen Mann stundenlang mit der zerschlagen der Körner beschäftigt sehen kann. Bei diesen

Operation wird das Fleisch ganz weggeworfen (eigner Geschmack). Gewöhnlich wird die Frucht in der Sonne getrocknet und dem Wintervorrath beigesetzt. Etwas wird in den Handel mit Tibet und Indien gebracht. Die bedeutendste Höhe wo ich Aprikosen sah, war im Indus-Thale, östlich von Lei, bis 13,000 Fuss."

"Der Pfirsichbaum kommt mit dem vorigen vor, er geniesst jedoch keine Aufmerksamkeit von dem Landmanne; die Frucht bleibt daher meist sehr klein, und wird in der Regel gar nicht genossen. Weiter unten im Thal sieht man den Pfirsichbaum oft wild wachsen. Er steigt nicht so hoch wie der Aprikosenbaum, ich sah ihn in der schönsten Entfaltung voriges Jahr [1865] in Kashmir zwischen 5,000 – 8,000 Fuss". [Atlas ~~Route~~ Peter also grow, but only four works]

* * *

p. 85-7

The following quotations are from Einige Betrachtungen über den Chr-

über der Flora und Fauna in der Umgebung von Chini, Provinz Bisahir im nordwestlichen Himalaya-Gebirge. Von Dr. F. Stoliczka. Paläontologe der geologischen Aufnahmen für Ostindien. Vorgelegt in der Sitzung vom 3 October 1866.

Sepratabdr. from Verhandlung. Zool-bot. Gesellsch. Wien, Band 16, 1866.

A very instructive paper, giving notes on climate, geology, fauna & flora. Seems to be the work of a careful man.

Mr. W. T. Swinglei Library.

Life of Peach Orchards in Connecticut.

"It is a fact that the yellows sometimes shows itself while the trees are in the nursery rows, and when planted in an orchard some trees need to be taken out every year till they are all gone, which with us will be in seven or eight years."

From a letter by Geo. F. Platt & Son, Milford, Conn.

Addressed to Secy of Agric. Washington, D.C. & Dated Nov. 20, 1893.

The Platts are fresh grows & before to set 30 acres of California grown peach trees on a new piece of ground in Spring of 1893.

Perch Yellows.

article denying existence
of yellows at Cape of Good
Hope. by McOwan & Mrs.
Pillans, is worthy of a
careful inquiry.
H. 612 – 614 Ag. Journ.
Cape Colony. Vol VII.
27th Dec. 1892 No. 26.

Charles Hopkins, Washington, D.C. Agric. Dept.,
visited Dorchester Co., Md. in December
1888, was at Cambridge and East New Market
Talked with peach growers. There
is no peach yellows in that County.
Dec. 30, 1888.